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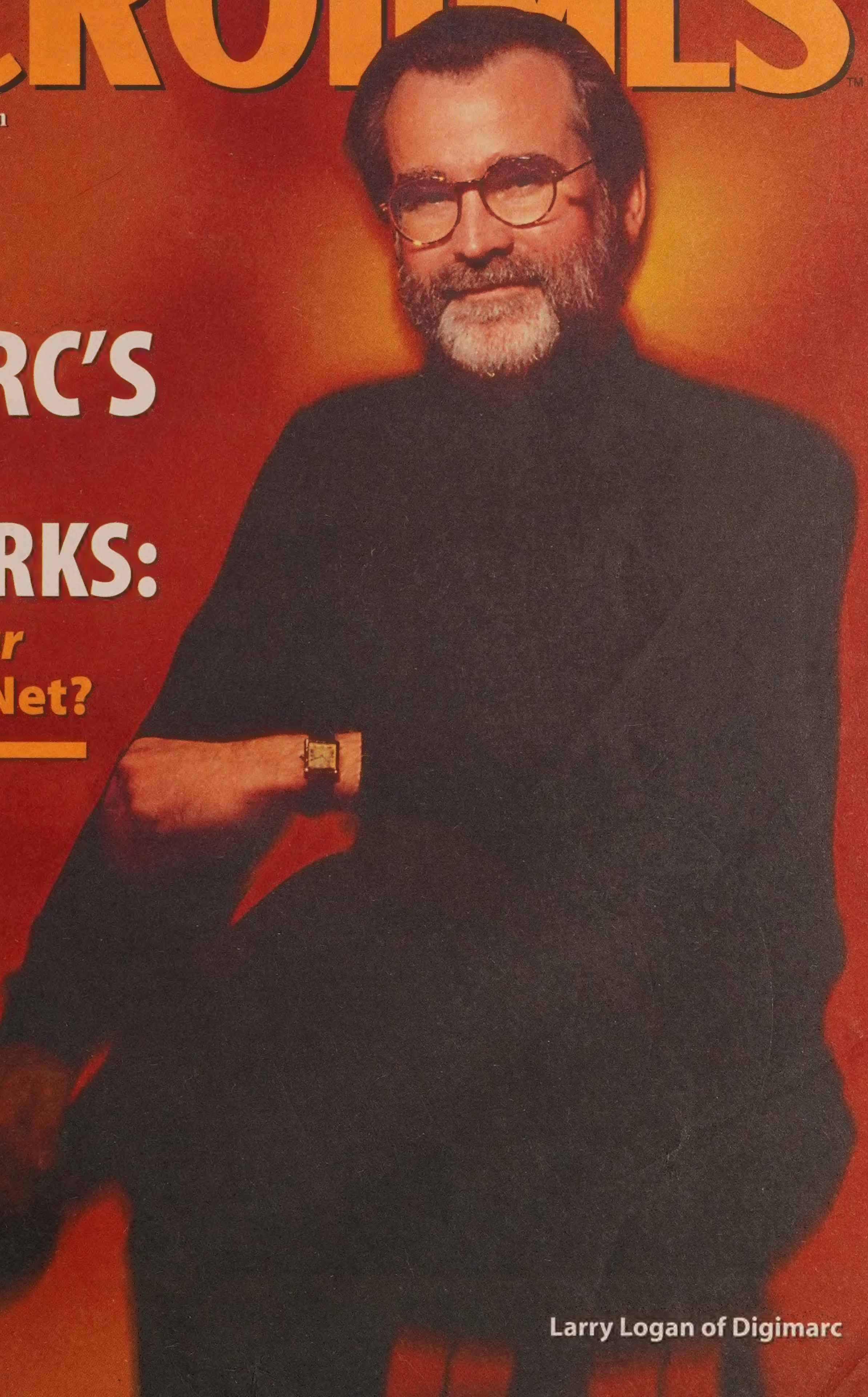

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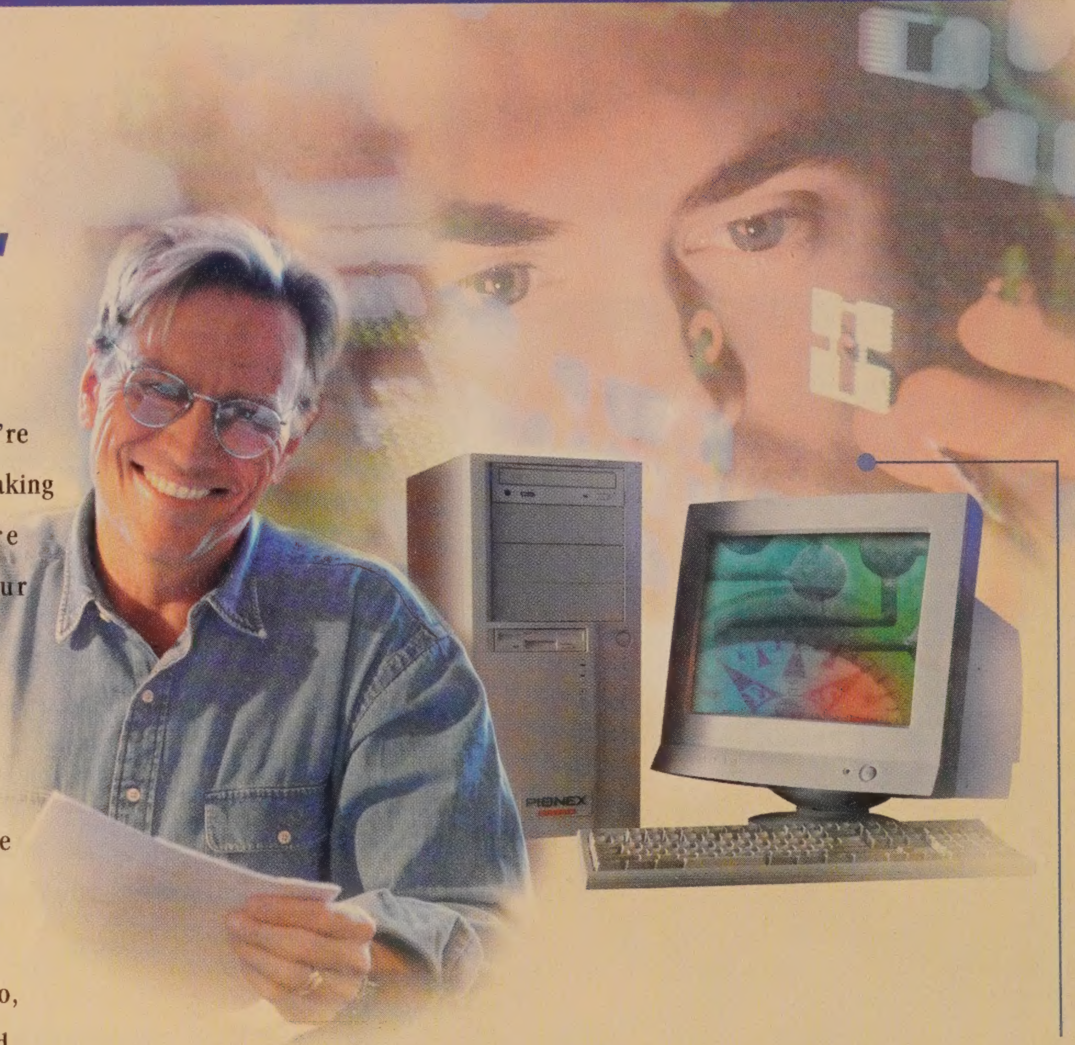

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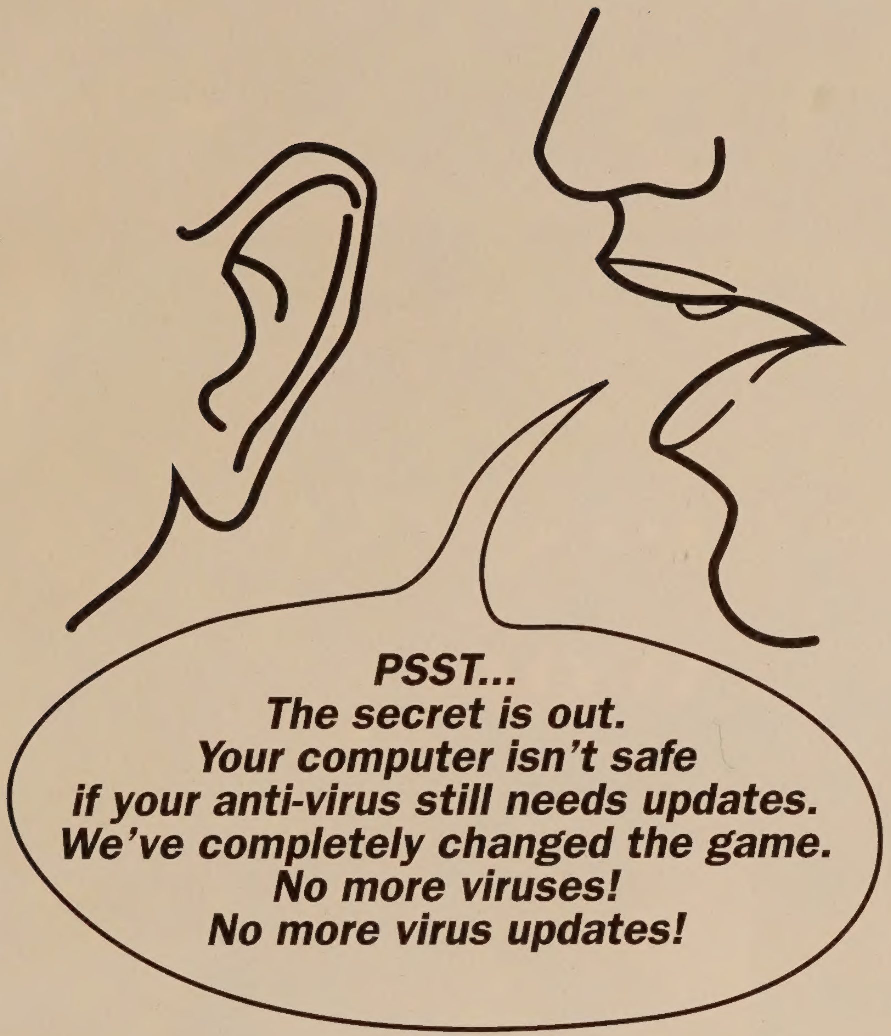
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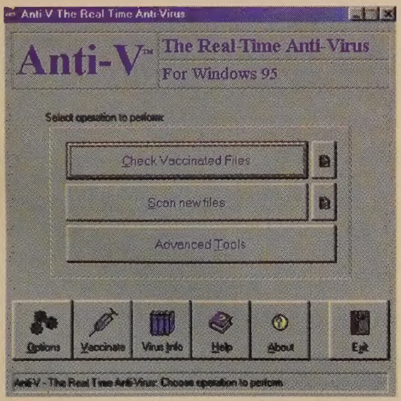
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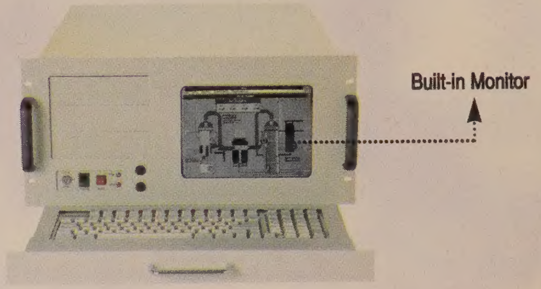

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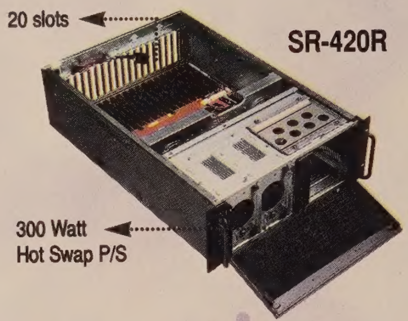

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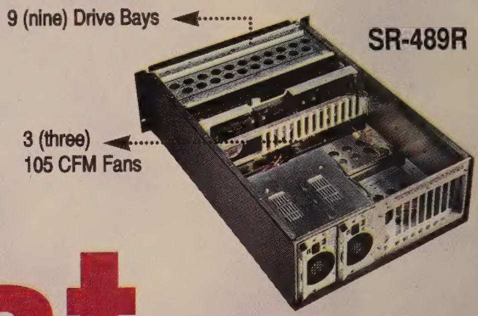

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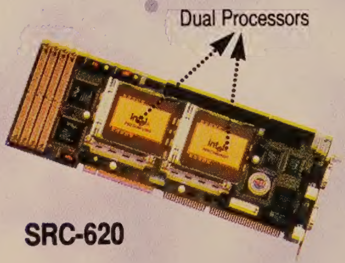

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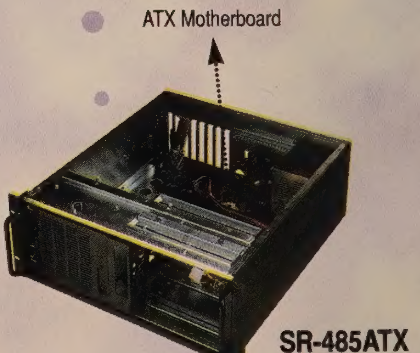

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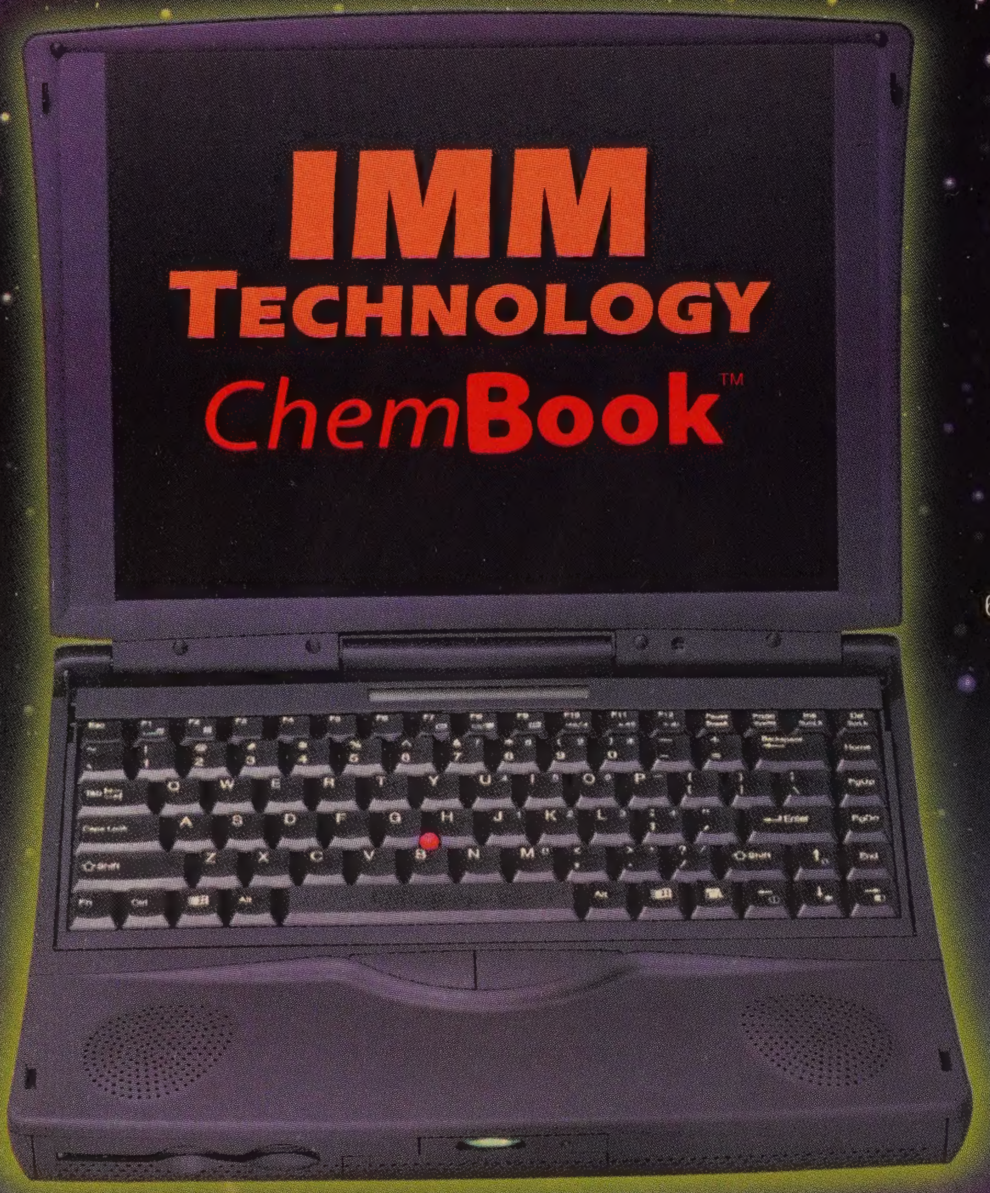

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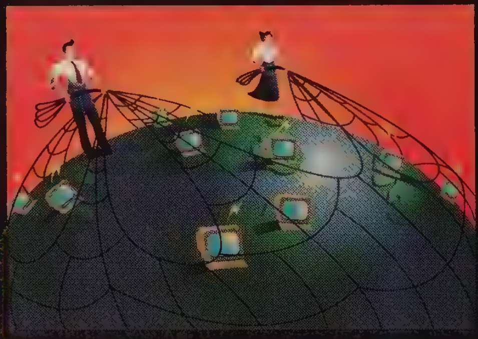

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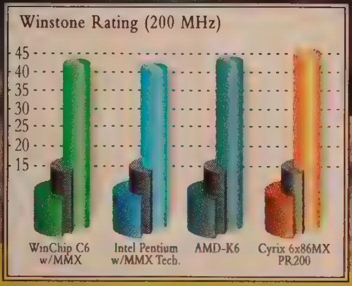

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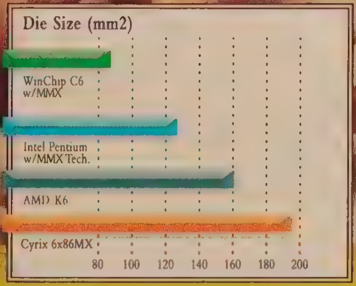

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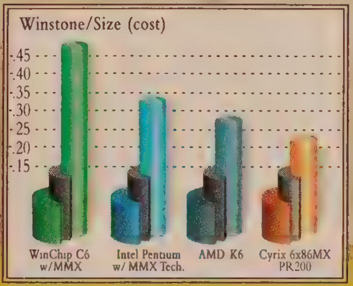
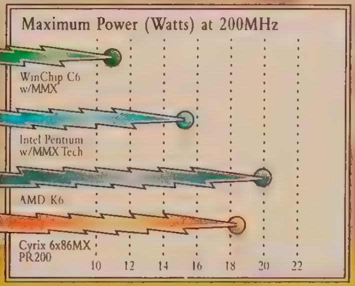


WinChip delivers the highest Winstone rating per square millimeter of die area among Pentium-class microprocessors.



WinChip runs cooler and thus more reliably than others, extending battery life for mobile users.

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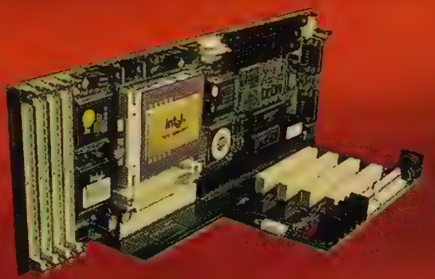

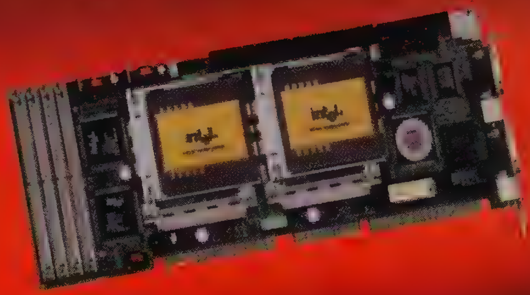

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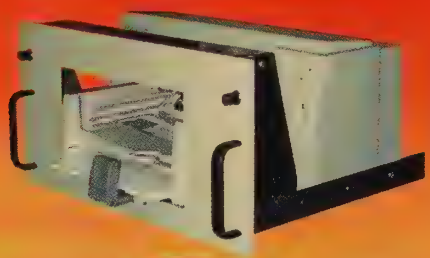

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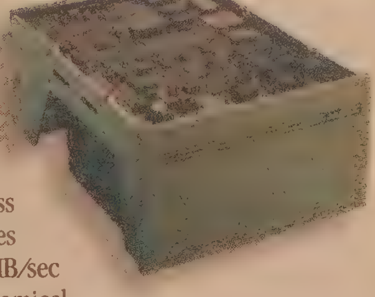

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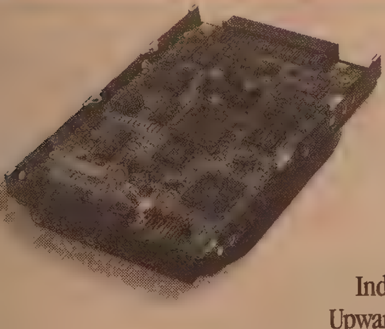

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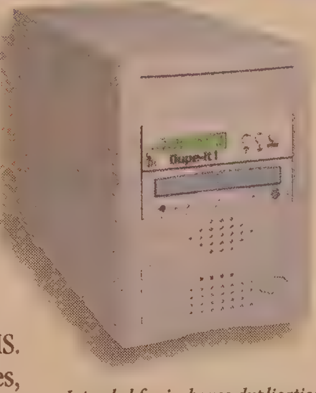

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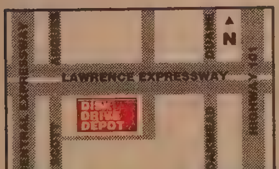

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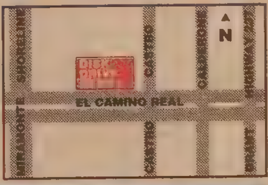

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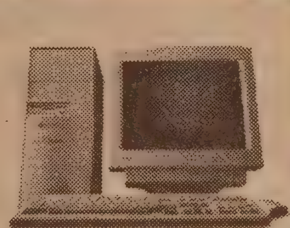

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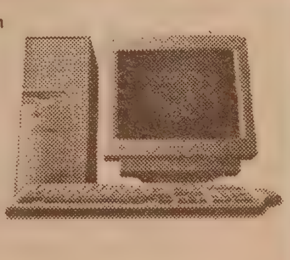

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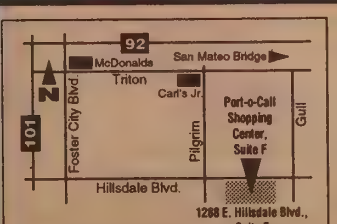

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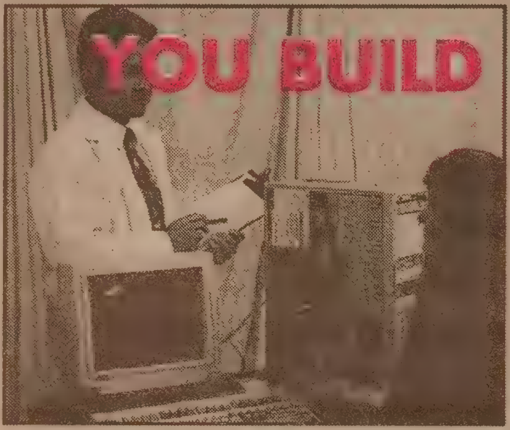

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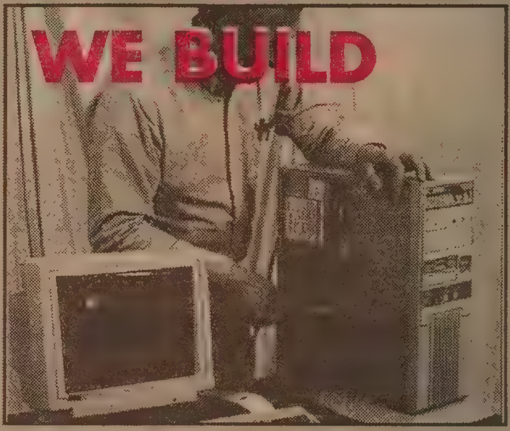

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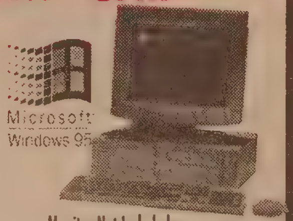

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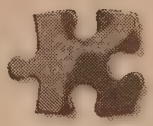

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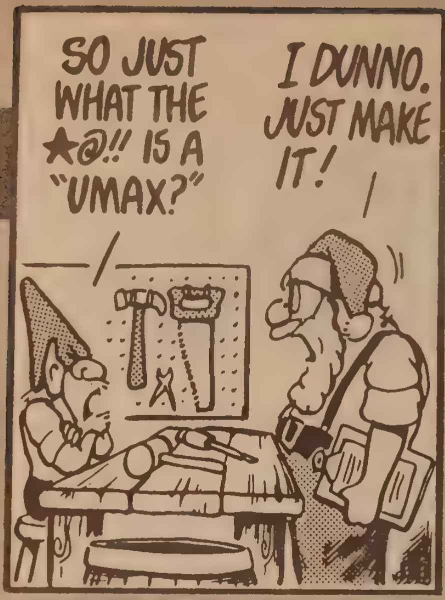
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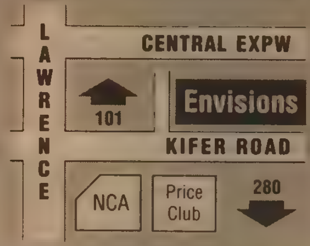

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Affordable photo fun for your home computer

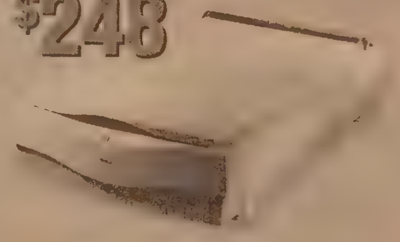
For basic image and text scanning at home or at work, the Umax Astra 610 delivers solid performance at a no-nonsense price. With 300dpi optical resolution, it captures enough image data for web pages and desktop color printers, and it's 30-bit color depth surpasses most monitors!

Choose from two configurations: the easy-to-install 610P, which connects to your printer port (PCs only), or the faster 610S, which requires a SCSI connection (included for PCs, built into Macintosh systems). Both include Adobe PhotoDeluxe and Presto! PageManager OCR.

Umax Astra 610P Color Scanner $128
Umax Astra 610S Color Scanner $148

ASTRA 1200

$248



600dpi scanning power for office work & publishing

Scanning images for high-resolution (720+ dpi) printers requires a high-resolution scanner like the Umax Astra 1200, our best-selling color scanner. The 1200 has an optical resolution of 600dpi, and the same high-quality optics that made Umax the 1997 Editors' Choice at both *PC Magazine* and *Macworld*.

The 1200 is the next generation of the Vista S12, which the editors of *PC Magazine* called an "unparalleled combination of value and performance." The Astra 1200 features high-definition 30-bit color and comes with Adobe PhotoDeluxe, Presto! PageManager OCR, and a SCSI card for connecting the scanner to PC systems.

Umax Astra 1200S Color Scanner $248

ASTRA 1200 PRO

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Adobe Photoshop 4.0

The power of Photoshop at an unbelievable price

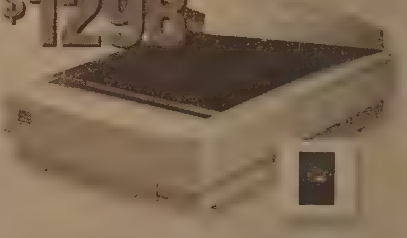
Ask today's top designers what they use to edit photographs and create complex images, and their universal response will be Adobe Photoshop. Now in its fourth version, Photoshop delivers the kind of graphics power that makes it a professional tool.

Now, through a special arrangement between Umax and Adobe, you can order an Astra 1200 and the latest version of Photoshop together at an unbelievably low price. The Photoshop software bundled with the Astra 1200 Professional is the same you would find at a retail store; the only difference is that the manuals are on CD-ROM (printed manuals available from Adobe for $35).

Umax Astra 1200S Color Scanner $498

POWERLOOK 2

$1298



Professional-quality color for pre-press & production

Scanners are like cameras — you can get good results from the affordable models, but for the best possible images you have to spend a bit extra. At $1298, the Umax PowerLook 2 isn't cheap, but with its high-quality tri-linear CCD optics, it offers great value to those looking for outstanding results.

When *Windows Magazine* reviewed the PowerLook 2, it said " 'gorgeous' is an understatement. Shadows and deep tones all come through and the sharpest details are rendered accurately both in monochrome and color." No wonder *PC Computing* named it "the best of the 36-bit scanners." The PL2 comes with Photoshop 4.0, PhotoPerfect, transparency adapter, and SCSI-2 adapter.

Umax PowerLook 2 Color Scanner $1298

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$448 CLEARANCE!

Unique dual-lens flatbed color scanning system

Looking for a great deal on a clearance scanner? When the Gemini D16 was new in 1995, it sold for close to $2000. Now it's available for less than $500, and its specs still beat the competition: 800dpi optical resolution, 30-bit color, and a high-speed cache. With its unique dual-lens optics, the D16 was ahead of its time. Now it can be yours for next to nothing — while they last!

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MDX 8000

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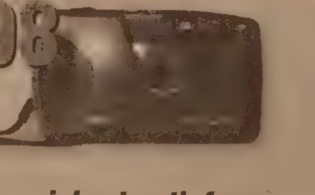

The quickest path from photograph to file

When you can't wait for film to be developed, reach for the new Umax MDX-8000 digital camera. With 1000 x 800 resolution and 30-bit color, the MDX-8000 is the perfect way to add high-quality graphics to web sites and multimedia projects. Includes batteries, adapter, electronic flash, self-timer, and Adobe PhotoDeluxe.

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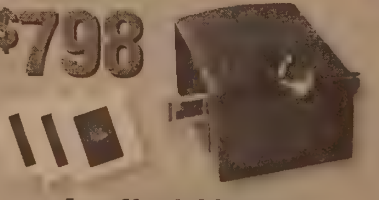

An affordable way to scan slides professionally

When scanning slides, no flatbed can match the performance of a slide scanner that focuses all of its optical resolution on a 35mm area. For serious slide scanning, we offer the Polaroid SprintScan 35/LE (1950dpi, 3.0 dynamic range) and the SprintScan 35 Plus (2700dpi, range of 3.4, and built-in DSP for fast image correction).

Polaroid SprintScan 35/LE $798
Polaroid SprintScan 35 Plus $1898

PAGE OFFICE IIC

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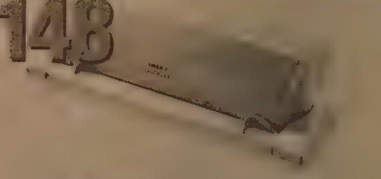

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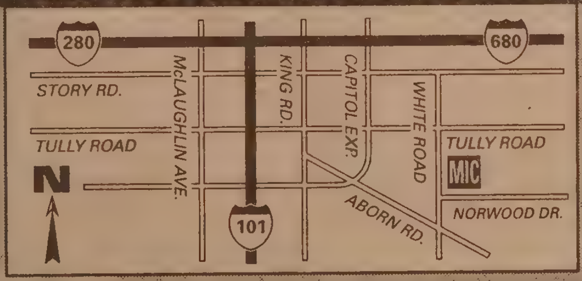

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Contents

MICROTIMES™
November 3, 1997 • Issue #171

COVER STORY

98
DIGITAL WATERMARKS: Who's Using *Your* Images On The Net?
BY MARY EISENHART
PHOTOS BY JAY BLAKESBERG
Digimarc's Technology Helps Manage The Online Copy Machine.

COVER SUPPLEMENTS:

116
Software Vendors Vs. Software Pirates
BY DAVID NOACK
The Internet Expands The Battlefield.

127
Intellectual Property In The Brave New Digital World
BY IVARS BEZDECHI
Creativity And Techno-Marxism On The Internet.

News & Views

20
Industry Insights
BY PAUL HOFFMAN
Destinations And Roadways:
Splitting Up CompuServe 20
MicroTimes Stock Index 26

28
Realizable Fantasies
BY JIM WARREN
The Evil Of Software Monopolies, uh, Patents: Part I.

246
Dvorak's Last Column
BY JOHN C. DVORAK
Locked Into An Alternative Reality.

Business Solutions

42
Laptops
BY ED KAHN
Other (Potential) Uses For PC Cards; Plus Tatung's TNB 5600.

52
UNIX
BY BENNETT FALK
The Gurus On Interfaces.

58
Licensing Writers
BY ROBERT MOSKOWITZ
L.A. Law Has Creative Community In Uproar.

68
Small Office/Home Office
BY BIRRELL WALSH
Things That Don't Work.

74
32-bit Computing
BY FABIAN PASCAL
Not By CPU Alone (First Of A Series).

92
Interviews The New-Fashioned Way
BY AUREN HOFFMAN
See No Evil, Hear No Evil.

94
The Making Of An Internet Startup: Part XIV
BY ROYAL P. FARROS
Venture In The Valley, Continued.

Features

132
BMUG
BY PETER LINDE AND SAM PENROSE
Viruses: They're Back, They're Bad!

144
Conference Preview
COMDEX/Fall '97

Online Guide

150
Internet
BY JOHN S. QUARTERMAN
The Domesday Net.

156
Online Services
BY BILL GRAM-REEFER
Bypass Internet Bottlenecks.

162
Web Page Listings

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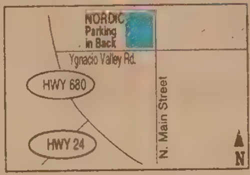

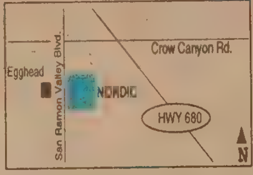

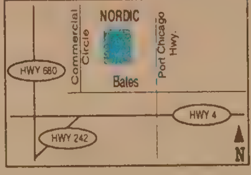

Contents

MICROTIMES™

November 3, 1997 • Issue #171

Multimedia & Beyond

176
Gulch Gossip
BY JONATHAN E.

182
Multimedia 101
BY JONATHAN E.
Net Media: The Dream.

Resources

190
Calendar Of Events
SF State Multimedia Studies Program Job Fair 190
MarketPro Computer Show & Sale 190

198
User Group/BBS Listings

205
Classifieds

237
Index Of Advertisers By City

242
Index Of Advertisers

Reader Resources

Quotation Hotline Form 50
MicroTimes "Super Stop" Locations 226
Classified Advertising Placement Form 205
Classified Career Marketplace 219

Job Hunting?
Check out the
Classified Career Marketplace
on page 219

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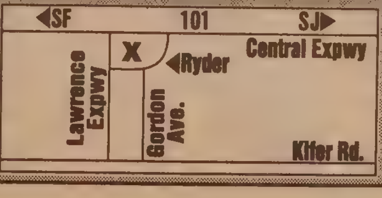

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Warren is one of the named plaintiffs in the constitutional challenge against the Communications Decency Act, that was overturned in June, 1997, by the U.S. Supreme Court.

He founded InfoWorld, was founding host of PBS' *Computer Chronicles*, founding editor of *Dr. Dobb's Journal* and served half a decade on the Board of Directors of Autodesk, Inc.

He has received the Hugh M. Hefner First Amendment Award (1994), James Madison Freedom-of-Information Award from the Society of Professional Journalists—Northern California (1994), the Electronic Frontier Foundation Pioneer Award (1992, its first year) and the John Dvorak Lifetime Achievement Award (1995).

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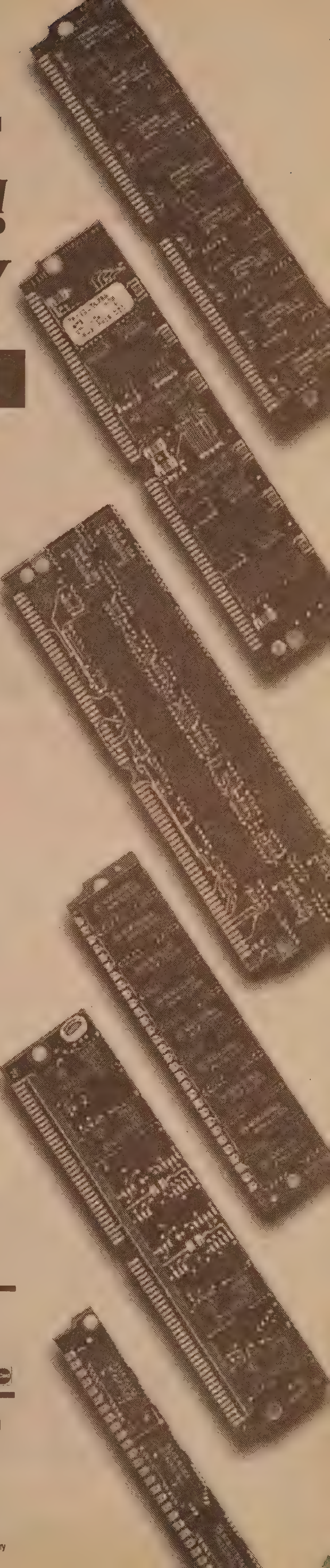

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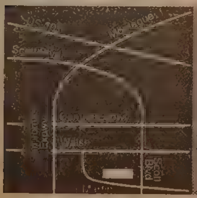

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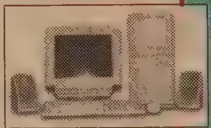

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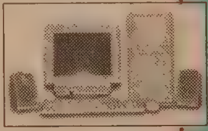

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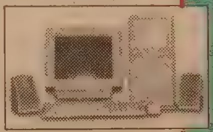

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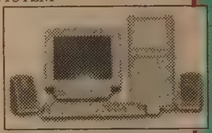

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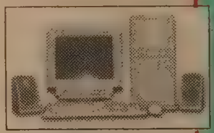

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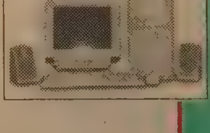

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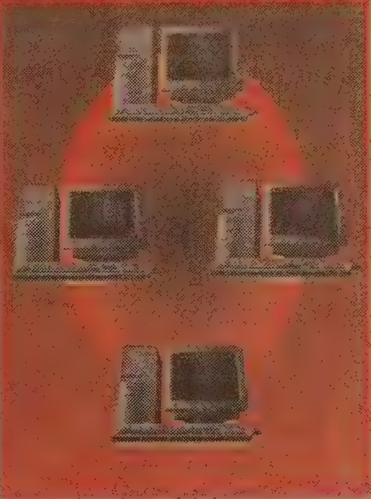

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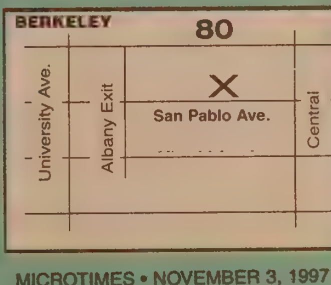

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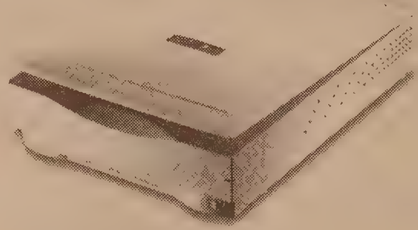

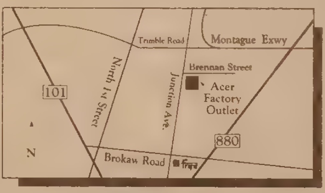

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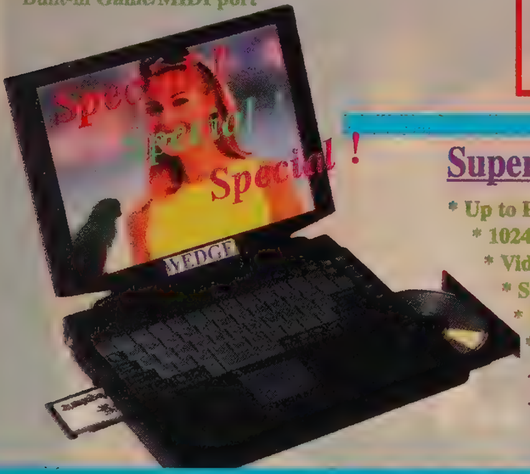

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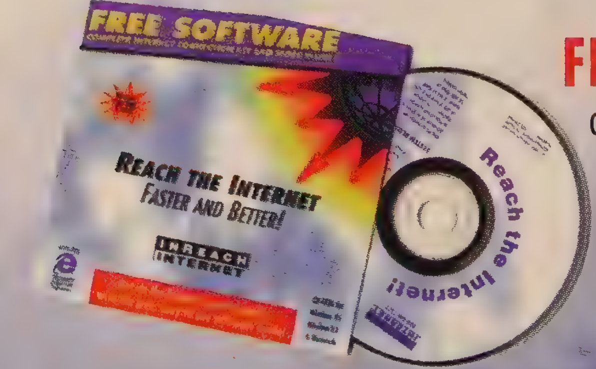

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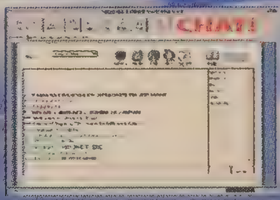

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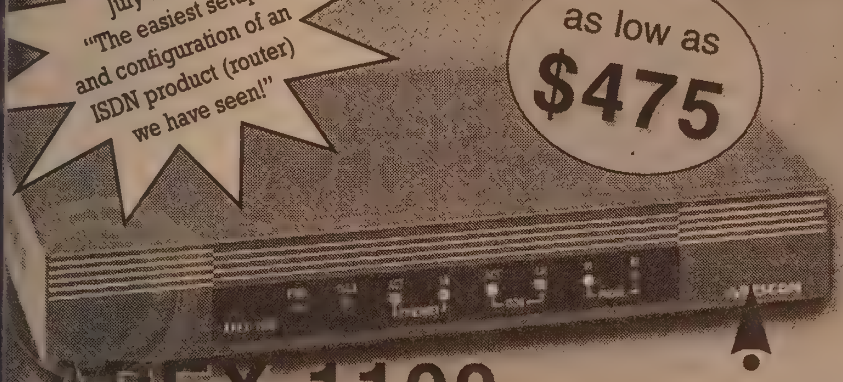

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News and Views

BY PAUL HOFFMAN

Industry Insights

Destinations And Roadways: Splitting Up CompuServe

One of the old giants has fallen.

Although few will remember five years from now, the act of breaking up CompuServe into content and network and selling each piece to different companies may be one of the turning points in Internet history. From now on, the biggest players in the market will be much more likely to focus on what they are providing and stop trying to be everything to everyone. Heck, even Microsoft might notice.

The fact that CompuServe was failing was not news; for years, it was going nowhere as an online service. Its parent company, H&R Block, was in way over its head, and had no idea how to compete with aggressive competitors like America Online (AOL) and the Microsoft Network. And although CompuServe had millions of loyal members worldwide, it was hard to unload because it just wasn't clear which parts could continue to make money after the sale was made.

On a personal note, I write this story with a bit of nostalgia. I became a CompuServe member in the paleolithic ages of the Internet, way back in 1979. At that time, CompuServe had a few tens of thousands of members, we thought 300 baud was blazingly fast, and the chat sessions were called "CB channels" because citizen's band (CB) radios were still popular. CompuServe was a true pioneer in online content, but it stopped its pioneering about five years ago, and its sale is the result of its lack of momentum.

Breaking Up Is Hard to Do

When the deal finally came together, the buyer turned out to be buyers: AOL took CompuServe's user base, and WorldCom took its network. But, to make the deal more interesting, WorldCom also bought AOL's network operations at the same time, with a long-term agreement to be AOL's primary supplier of network services. This leaves WorldCom, which had acquired long-time Internet backbone supplier UUNet last year, as a huge supplier of modem pools and backbone service.

Thus, what started off as two companies that each had lots of content and lots of modems, plus one company that had no content and lots of modems, mixed and mashed into one company with even more content (AOL), and another with even more modems (WorldCom). Now, there is no one who can compare to AOL for number of users who are willing to pay for Internet access and content, and there is no one who can compare to WorldCom's hundreds of thousands of modem ports and the backbone to support them.

A few weeks after the CompuServe announcement, WorldCom also made a bid to buy MCI, a major competitor of WorldCom's in many markets, including long-distance telephone calls. If the bid is sucessful (and there are many potential impediments), WorldCom will have about half of the backbone capacity in the US. So, although WorldCom's acquisition of AOL and CompuServe's network operations is important, it may be dwarfed by the purchase of MCI.

Although people have been talking for years about the difference between content and delivery on the Internet, many companies were confused about how to separate them. This confusion was particularly difficult for financiers to believe, given how fast AOL was growing even as it tried to supply both access and information to its users. AOL finally realized that providing both was a management nightmare and chose to concentrate on content, while buying its Internet service from WorldCom.

Combining content and delivery services will still make sense to some Internet companies, but the media market has lots of examples of different strategies. For instance, most large newspapers own their own presses and pay the people who fill the newsracks and deliver the newspaper to your door. On the other hand, major television networks do not produce most of their shows: They buy many from independent companies and simply transmit them (after having sold the advertising that goes with them, of course).

WorldCom Gets The World

CompuServe is a well-known network provider in many parts of the world, and WorldCom will certainly benefit from that. In fact, AOL's in-house network service, ANS, also had a fair amount of presence outside the US, so the combination of these two could certainly help

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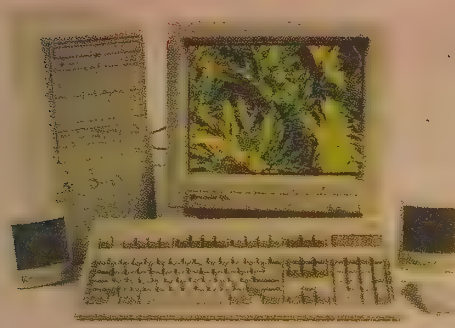

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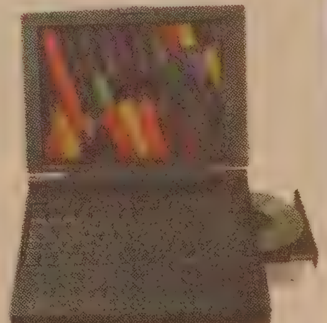

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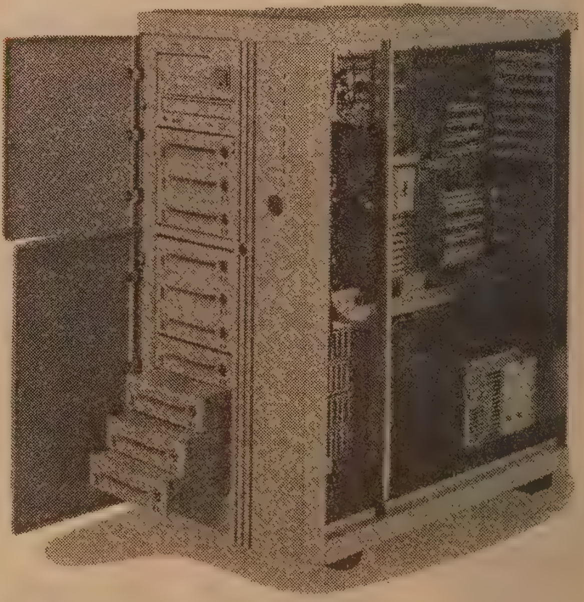

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WorldCom become a leader in worldwide telecommunications.

People in the Internet industry often forget that WorldCom started off as a long-distance reseller and still has a very strong interest in the telephone world. Combine this with a worldwide Internet network, and you might start seeing international calling becoming much less expensive. If WorldCom's bid for MCI is successful, however, they may have so much of the market they won't feel as much pressure to lower rates.

Controlling and growing content outside of the US will be much harder for AOL than controlling and growing the Internet will be for WorldCom. Local culture is singularly important for content, particularly for entertainment. For example, the number of Europeans interested in sharing a evening in an AOL chat room with a bunch of adolescent male Americans will be vanishingly small. Even though Hollywood has historically been successful at filling the entertainment media in other countries with US-made products, the past decade has shown that local content is becoming much more popular, and AOL will have an uphill battle in the world market.

Mom And Pop Can Still Play

There are thousands of local Internet Service Providers (ISPs) throughout the US, and many of them will look to the splitting of content and bandwidth of CompuServe as a good sign, since only a tiny fraction of local ISPs provide much content. However, this analysis is almost certainly short-sighted, given that WorldCom will now be able to offer almost identical services as the ISPs for much less.

WorldCom and the other national backbone carriers that have dial-in ports throughout the country will soon be turning to end users and not just the business market, at least in large metropolitan areas. Although customer support costs for individual users can be high, the economies of scale of owning tens or hundreds of thousands of modems can give the national ISPs enough extra money to hire enough customer support people to answer the "it used to work but now it doesn't" questions.

In fact, if local ISPs learn anything out of the CompuServe deal, it's that they had better add at least a little character to their service, or risk losing customers to national services that are all-character. Sure, it's usually network geeks who start up ISPs, but that doesn't mean that they can't hire a content person or two to give their customers (and only their customers) something that makes them not want to leave the service when a national service offers, at the same price, many more Internet services.

This is not a prediction of doom and gloom for local ISPs, either in the US or in other countries. It's likely that there will still be thousands of them a few years from now, but the growth in the ISP market will turn into shrinkage before then as access-only companies get passed over by the companies that also give the end users a

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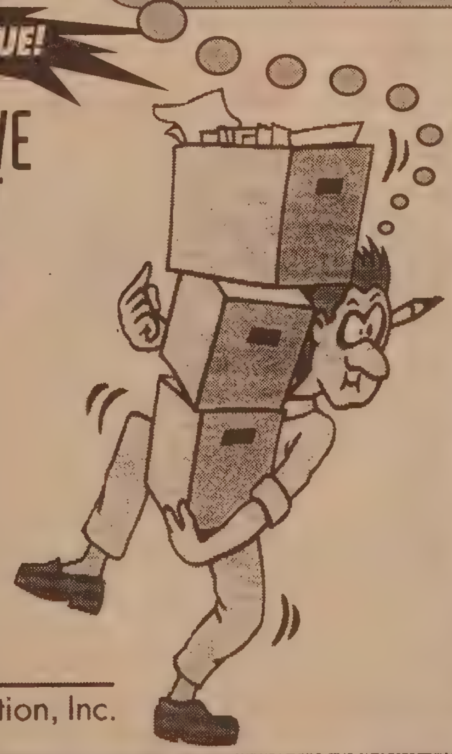

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reason to want to be on the Internet other than to get their email. AOL has learned this lesson well, and will continue to work hard at providing interesting content to justify its lower-quality customer service and slow speeds.

The other factor that will hurt local ISPs is the changing status of their connections to the global Internet. For example, an ISP in an area with many Mexicans and Mexican-Americans had better be connected to the Internet in a way that gives its users faster access to Internet sites in Mexico. If it doesn't, one of its competitors will, and users will notice the difference. It's quite difficult to predict which of the national backbones will do the best job with this kind of connection, so ISPs will also have to get used to switching carriers more often.

The Maturing Of The Backbone

Many people still bandy about the phrase "content is king." If that's true, the kingdom's boundaries are impossible to define, and about two dozen princesses and princes are constantly battling for the throne. Worse yet, the commoners change what they want from the king every few years, and have the attention span of a two-year-old child in a room of bright, shiny objects. Best of luck to those kings.

Delivery is always a more boring business than the manufacturing and selling of the things that get delivered. Building cars and owning parts of destinations is much more glamorous than building and maintaining the roads. Nonetheless, the roads need to get built, and they certainly need to be maintained. The same is true for the Internet.

The major vendors of business connectivity on the Internet are still scrambling to find a workable economic model for the business they're in. Companies buy service based on local access points, but will switch to a competitor if their provider's backbone slows down too much. Customers want service; they don't really know what to ask for, but they sure know when it isn't working.

WorldCom's deal to buy the backbone portions of AOL and CompuServe will strengthen its presence in many areas, and allows it to compete head-to-head with better-known names like MCI and AT&T (or even to gobble up MCI and therefore control almost half of the US backbone). Even better, it already has lots of guaranteed customers, representing all of the major content providers like AOL, CompuServe, the Microsoft Network (MSN), and so on.

Right now, WorldCom is responsible for the dial-in capabilities of over eight million people. This will certainly help draw corporate customers, who want to use the Internet to link its offices as well as to link its employees who travel or work from home. Many companies have failed miserably at running their own remote access servers (RASs) for their employees. A small number of national, and international, backbone providers with local dial-in service could probably replace most local RAS operations.

Splitting CompuServe will result in better service for business users, and probably better content for CompuServe's millions of subscribers. The differentiation of content from delivery will be a boon to all, although it will probably squeeze the companies who were emulating the old AOL. Five years ago, the idea of a single company doing everything made a lot of sense, but the CompuServe deal may put that idea to rest forever. ■

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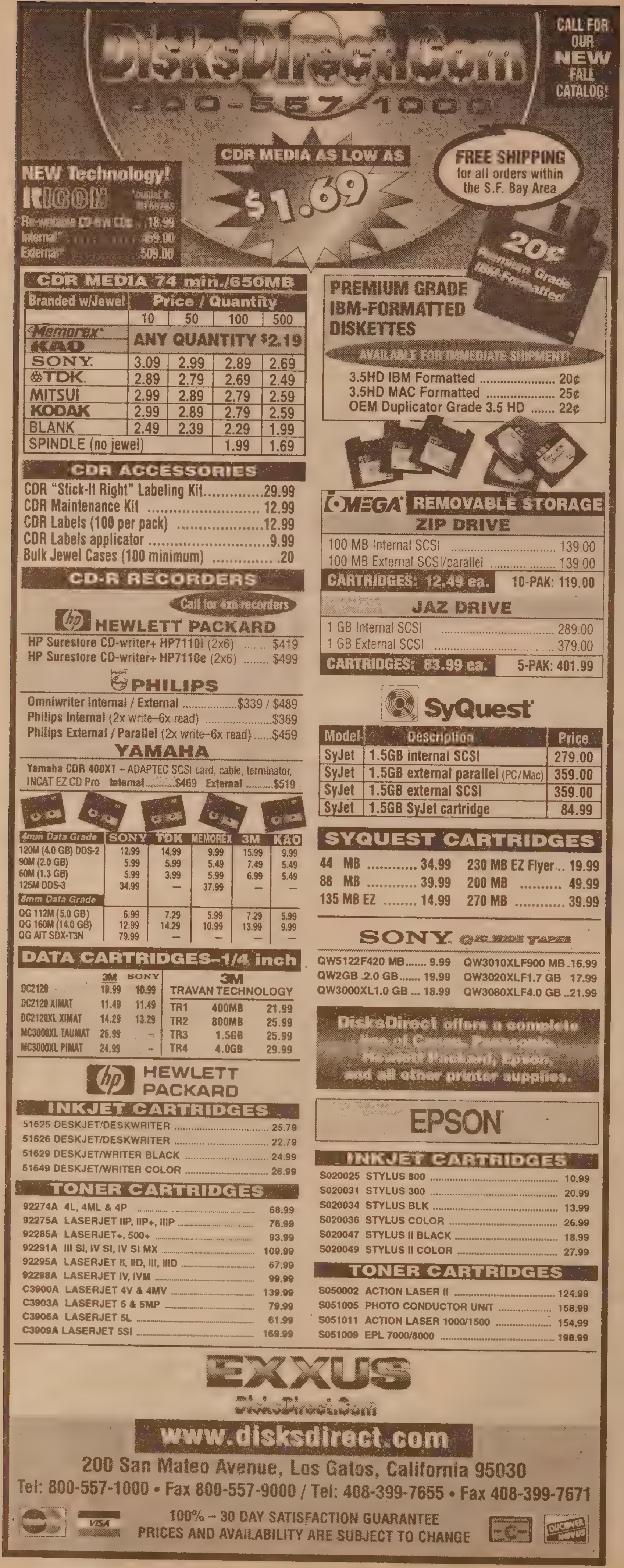

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- Sound Blaster AWE 64 Chipset
- Yamaha 3D PnP 16-Bit PnP Sound Card
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- 56.6 Voice/Fax/Modem
- Mid-Tower/230W PS
- Win95 104 Keyboard and Mouse
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- 1.44 Floppy
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- Matrox Millennium II 4MB WRAM
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- 320-Watt Speakers w/Built-in Subwoofer
- 56.6 Voice/Fax/Modem
- Super Mini-Tower w/230W PS
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M2/233 . . . $2175
AMD K6/166 . . . . $1975 K6/200. . . . . . $2035
K6/233 . . . $2200
MMX/166. . . . . . $1995 MMX/200 . . . . $2095
MMX/233 . . . $2195

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- Intel 440 FX Chipset ATX Motherboard
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- IO/IDE Controller PnP Flash BIOS
- CPU w/Cooling Fan
- 32MB RAM 60ns 72pin EDO
- 4.3GB Ultra IDE Hard Drive
- 1.44 Floppy
- Impression 7 Plus .27 SVGA 17" Monitor
- Diamond Stealth 3D S3 Virge 4MB EDO
- Toshiba DVD CD-ROM
- Sound Blaster AWE 64 PnP
- 320-Watt Speakers w/Built-in Subwoofer
- 56.6 Voice/Fax/Modem
- Super Mini-Tower w/230W PS
- Win95 104 Keyboard and Mouse
- Windows 95 Registered in Your Name w/CD
- MS Works 97, MS Money 97, Comptons 97
- Netscape Navigator, Shareware Games
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Cyrix M2/166 . . . $1955 M2/200 . . . . . $1995
M2/233 . . . $2195
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Industry Insights *continued...*

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EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 09/25/97	CLOSING PRICE 10/16/97	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	P/E RATIO	ANNUAL IVIDEN RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE											
NAS	Adobe		ADBE	50.81	49.75	-1.06	-2.09	18	0.20	0.40	53.13	32.50
NAS	Autodesk	(H)	ADSK	43.25	47.72	4.47	10.33	-	0.24	0.50	51.13	21.00
NAS	Borland	(H)	BORL	9.81	9.88	0.06	0.64	-	0.00	0.00	10.75	4.75
NAS	Broderbund	(H)	BROD	36.00	30.38	-5.63	-15.63	-	0.00	0.00	37.75	17.75
NAS	Informix		IFMXE	6.53	6.88	0.34	5.26	-	0.00	0.00	29.50	5.88
NAS	Macromedia		MACR	12.50	12.06	0.44	-3.50	-	0.00	0.00	21.75	6.50
NAS	Microsoft		MSFT	132.75	133.91	1.16	0.87	51	0.00	0.00	150.75	65.63
NAS	Novell		NOVL	9.03	9.38	0.34	3.81	117	0.00	0.00	13.00	6.28
NAS	Oracle		ORCL	38.25	34.44	-3.81	-9.97	49	0.00	0.00	42.13	22.50
NAS	Symantec		SYMC	22.00	21.00	-1.00	-4.55	29	0.00	0.00	25.75	9.88
	HARDWARE											
NAS	Apple		AAPL	21.13	21.50	0.38	1.78	-	0.00	0.00	29.56	12.75
NYS	Compaq		CPQ	73.31	72.94	-0.38	-0.51	36	0.00	0.00	79.56	20.50
NYS	Digital Equipment	(H)	DEC	42.88	48.88	6.00	13.99	72	0.00	0.00	50.94	25.00
NAS	Dell	(H)	DELL	98.00	98.81	0.81	0.83	49	0.00	0.00	103.25	19.00
NYS	Gateway 2000		GTW	33.06	34.81	1.75	5.29	20	0.00	0.00	46.25	19.38
NYS	Hewlett-Packard		HWP	71.56	65.38	-6.19	-8.65	23	0.56	0.86	72.94	42.75
NYS	IBM		IBM	101.63	99.88	-1.75	-1.72	17	0.80	0.80	109.44	62.00
NYS	Silicon Graphics		SGI	26.56	16.25	-10.31	-38.82	38	0.00	0.00	30.31	12.63
NAS	Sun Microsystems		SUNW	48.94	42.31	-6.63	-13.54	22	0.00	0.00	53.31	25.50
NYS	Tandy	(H)	TAN	33.13	35.38	2.25	6.79	-	0.40	1.13	37.19	18.63
NYS	Xerox	(H)	XRX	79.69	85.56	5.88	7.37	23	1.28	1.50	86.13	44.63
	CPU'S											
NYS	Advanced Micro Devices		AMD	32.63	28.75	-3.88	-11.88	-	0.00	0.00	48.50	17.00
NYS	Cypress Semiconductor		CY	16.19	12.69	-3.50	-21.62	60	0.00	0.00	18.94	10.50
NAS	Cyrix	(H)	CYRX	32.75	30.13	2.63	-8.02	-	0.00	0.00	35.00	16.75
NAS	Intel		INTC	93.13	85.38	-7.75	-8.32	22	0.12	0.14	102.00	51.88
NYS	LSI Logic		LSI	32.44	24.00	-8.44	-26.01	23	0.00	0.00	46.88	24.00
NYS	Motorola		MOT	68.81	69.88	1.06	1.54	39	0.48	0.69	90.50	44.13
	COMMUNICATIONS											
NAS	3Com		COMS	50.25	51.06	0.81	1.62	44	0.00	0.00	81.38	24.00
NYS	AT&T	(H)	T	44.94	43.56	-1.38	-3.06	14	1.32	3.03	47.44	30.75
NYS	BellSouth Corp	(H)	BLS	46.50	47.44	0.94	2.02	18	1.44	3.04	49.44	36.25
NAS	Cisco	(H)	CSCO	72.88	81.69	8.81	12.09	54	0.00	0.00	83.50	45.25
NAS	MCI		MCIC	29.81	38.13	8.31	27.88	22	0.05	0.13	43.38	23.88
NYS	Northern Telecom	(H)	NT	103.94	107.50	3.56	3.43	40	0.60	0.56	113.88	57.75
	INTERNET											
NAS	Earth Link		ELNK	19.50	18.88	-0.63	-3.21	-	0.00	0.00	22.50	8.63
NAS	Netcom	(H)	NETC	12.00	20.25	8.25	68.75	-	0.00	0.00	21.88	7.88
NAS	Netscape		NSCP	39.50	35.56	-3.94	-9.97	-	0.00	0.00	65.00	23.50
NAS	Yahoo	(H)	YHOO	50.06	48.63	-1.44	-2.87	-	0.00	0.00	58.63	11.25
	MEDIA											
NYS	Disney	(H)	DIS	79.63	84.94	5.31	6.67	31	0.53	0.62	87.81	63.50
NAS	TCI	(H)	TCOMA	20.75	23.56	2.81	13.55	-	0.00	0.00	24.06	10.75

KEY: NYS = NEW YORK ASE = AMERICAN NAS = NASDAQ
(H) = NEW HIGH REACHED IN PERIOD (L) = NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES	20
DECLINES	19
UNCHANGED	0
NEW HIGHS	16
NEW LOWS	0

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER	Cisco	$	8.81
LARGEST DOLLAR LOSER	Silicon Graphics	$	-10.31
LARGEST PERCENTAGE GAINER	Netcom	68.75	%
LARGEST PERCENTAGE LOSER	Silicon Graphics	-38.82	%

	CLOSE 09/25/97	CLOSE 10/16/97	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD
MICROTIMES STOCK INDEX	11081.52	10985.85	-95.67	-0.86
DOW JONES INDUSTRIAL AVERAGE	7848.01	7938.88	90.87	1.16
STANDARD & POOR'S 500 INDEX	937.91	955.25	17.34	1.85
N.Y.S.E. COMPOSITE	491.52	502.30	10.78	2.19
NASDAQ COMPOSITE	1678.89	1699.66	20.77	1.24

CLOSING QUOTES FOR GRAPH:

DATE	MICRO TIMES	DOW JONES
04/10/97	8083.85	6540.05
05/08/97	9110.24	7136.62
06/05/97	9223.00	7305.29
07/03/97	9842.13	7895.81
07/31/97	11003.29	8222.61
08/28/97	10650.13	7694.43
09/25/97	11081.52	7848.01
10/16/97	10985.85	7938.88

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The MicroTimes Stock Index fell 95.67 points, or -0.86%, to close the period ended October 16 at 10985.85. In comparison, the Dow Jones Industrial Average rose 90.87 points, or 1.16%, to close at 7938.88. The technology sector continued to outperform the broader indices as the NASDAQ Index beat all with a 20.77 point gain, a 1.24% boost.

In our index, advancers nudged out decliners by a 20:19 margin. Similarly, sixteen companies reached annual highs, versus none that fell to a 52-week low.

Turning To Stocks In The Accompanying Table

Shares of Cisco System moved higher after the company's rating was increased. Cisco System watched its stock price increase $8.81 per share, to close the period at a price of $81.69, making it the highest dollar gainer in our index. Paine Webber announced late in the month that it raised its rating on shares of Cisco Systems to buy from neutral.

Furthermore, the company announced that it had reached an agreement with Wake County Public School System to provide connectivity for faculty and administrators and potential Internet access for students for 110 sites across Wake County Public School System (WCPSS). WCPSS contracted systems integrator SSDS to provide a network infrastructure, safe Internet access and email capabilities for 106 schools and four administrative locations across the school system. Cisco Systems, the worldwide leader in networking for the Internet, has teamed with SSDS to provide internetworking hardware for the entire network.

Netcom was the index's largest percentage gainer last month, as investors demonstrated their confidence in the company's pending acquisition by local exchange carrier ICG Communications Inc. Shares of Netcom rocketed 68.75%, or $8.25, to close the trading period at $20.25. Confidence in the company was not held by all as Salomon Brothers announced it lowered its rating on shares of Netcom to hold from buy. "We believe the stock will now trade on an arbitrage basis until the deal closes in the first quarter of 1998 and we are therefore downgrading the shares from buy to hold," analyst Marc Usem said in a research note.

Shares of LSI Logic fell as investors demonstrated that they are nervous about semiconductor equipment stocks, after recent third-quarter earnings disappointments by the major customers of equipment makers, semiconductor firms such as Intel Corp. and LSI Logic. LSI Logic watched its stock fall -26.01%, or $8.44 per share, to close at $24.00. ■

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REALIZABLE FANTASIES • BY JIM WARREN

The Evil Of Software Monopolies, uh, Patents: Part 1

Jim Warren's Statement To The Patent And Trademark Office

This and my next two columns are the formal statement that I submitted to the first-ever, still-unique, ever-so-brief several-day hearings about software patents, conducted *beyond* Washingtoontown's Beltway, in San Jose, CA, in March of 1994. They were chaired by the Patent and Trademark Office's (PTO) Commissioner, Bruce Lehman, previously a well-established attorney for various corporations that were wealthy enough to afford Beltway-centered representation.

I made this presentation as the official statement and position of Autodesk, Inc., then the 6th-largest microcomputer software publisher in the world. (I was a member of its Board of Directors at the time.) Sadly, Autodesk was the only one of those "Big 6" that bluntly opposed software patents.

The presentation was in three parts: principles, pragmatics and specific recommendations.

Principles Opposing Software Patents

Software is clearly useful. In many ways, it is the quintessential "useful art."

Software accepts input, just as machines accept input or controlling directions. Software produces output, just as machines produce output or results. And machines can be patented. Also, software is a crucial component of some machines—especially process-control devices such as the rubber molds of *Diamond v. Diehr*.

So why shouldn't software be patented? (To keep from muddying the waters, please accept that my remaining remarks may not apply to software designed primarily to control physical equipment.)

We all know that software is somehow different from all traditional inventions. But how does it differ from the devices that are surely what the framers of the Constitution envisioned when they mandated patent protection?

The difference is that all traditional inventions enhance our physical capabilities, whereas software mimics the mind and enhances our intellectual capabilities. That is what makes software different from all patentable devices, and that is what justifies *sui generis*.

Software mimics the stimulus functions of the mind. But the patentable input devices that permit software to mimic vision, hearing, touch, taste and smell are as different from the software as human senses are different from the mind.

> The fundamental question is: Do we want to permit the monopoly possession of everything that works like logical intellectual processes? **I hope not.**

Software mimics the memory of the mind, but the patentable storage devices are as different from software as the physical brain is different from the intellectual processes it performs.

And software mimics the response functions of the mind, but the electronic and electromechanical output devices are as different from the software as thought is from action.

Software is not a gadget.

What Software Is

So, let me define what software is, for the purpose of our discussion, based on its functionality—its utility; the useful character of its art:

Software is what occurs between stimulus and response, with no physical incarnation other than as representations of binary logic.

Prior to the 17th century, analytical intellectual processes and algorithms—sometimes called mathematics, sometimes called logic, often called philosophy—were conducted in natural language, written and verbal. It is amazing to realize what intellectual advances were made using no more than those primitive "inventions"—language and writing.

Then René Descartes "invented" symbolic mathematics. And in the next four centuries, we came to depend on manipulating the hieroglyphics of symbolic mathematics—and to some extent of symbolic logic—to aid in performing our analytical intellectual processes to solve problems of the mind, primarily but not exclusively mathematical problems and processes. That "invention" massively enhanced our ability to perform analytical intellectual processes.

Could Descartes have patented symbolic mathematics? I think not.

In the 19th and 20th centuries, the performance of analytical intellectual processes—"algorithms," if you will—was further greatly enhanced by the use of mechanical and electromechanical calculators, where the intellectual processes were "inventions" of sequences of button-pushes and crank-turns. And they per-

continued on page 32

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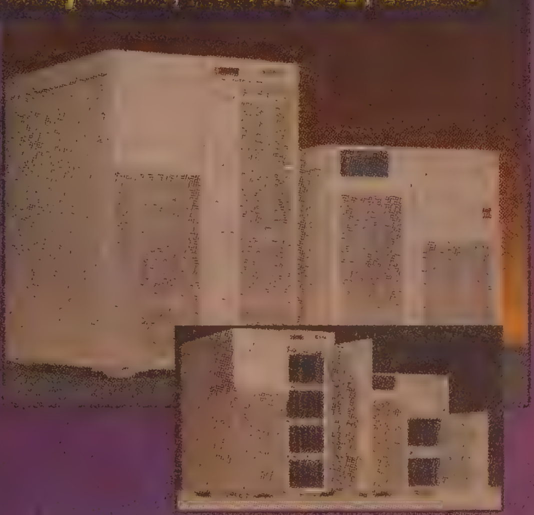

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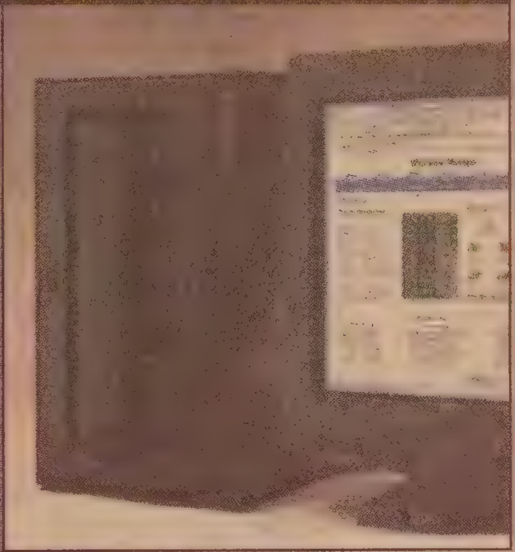

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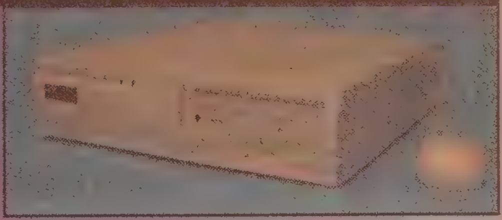

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Realizable Fantasies

continued from page 28

mitted problem-solving sophistication that was simply not possible without the machines.

The machines that aided the mind were patentable. The intellectual processes for logically solving problems—the computational sequences or algorithms—were often novel, often wildly non-obvious, and certainly useful.

But did those arithmetic and logical intellectual processes become patentable once they were assisted by a machine? I hope not.

The Human Computer

As a telling aside, the name "computer" derived from the first so-named machines replacing World War II women who were calculating ballistic trajectories by executing algorithms using row upon row of Marchant calculators. The name of the government job-classification for those women was "computer."

Furthermore, Eckert and Mauchly invented the first all-electronic computer, the Electrical Numerical Integrator and Computer—the ENIAC. And John Mauchly's wife was one of those "computers"—and a delightful human being, at that.

Descartes' symbolic mathematics and symbol-manipulation provided an alternative for representing and performing algorithmic processes of the mind, and greatly expanded the intellectual limits of our mind—but its symbols and processes were not patentable.

> Software mimics the memory of the mind, but the patentable storage devices are as different from software as the physical brain is different from the **intellectual processes** it performs.

Calculators offered another alternative for representing and performing algorithmic processes of the mind, but the processes were not patentable.

Now, software offers another alternative for representing and performing the logical and computational algorithmic processes of the mind. So instead of assisting our intellectual processes by unpatentable manipulations of symbols on paper, or unpatentable sequences of button-pushes, we now represent the content and performance of our intellectual tasks in binary form and let the computer mimic our mind. And it, again, greatly expands the intellectual limits of our mind.

Small wonder that there are those who want to monopolize anything that works like it.

The fundamental question is: Do we want to permit the monopoly possession of everything that works like logical intellectual processes? I hope not.

The mind has always been sacrosanct. The

continued on page 37

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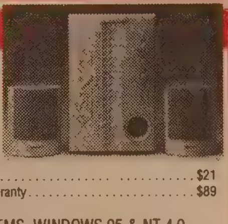

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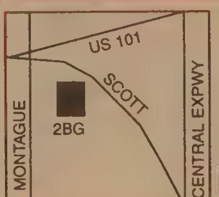

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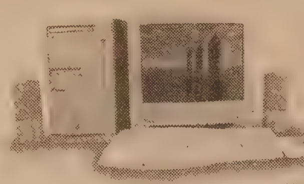

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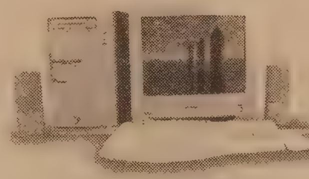

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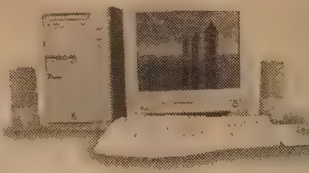

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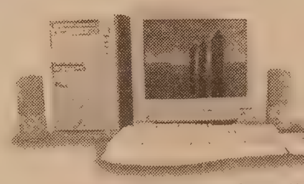

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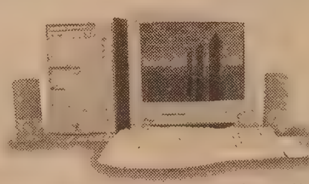

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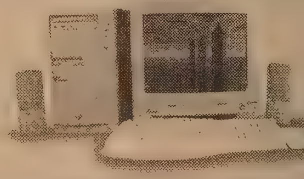

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Realizable Fantasies

continued from page 32

claim that intellectual processes and logical procedures (that do not primarily manipulate devices) can be possessed and monopolized extends greed and avarice much too far. Algorithmic intellectual processes must remain unpatentable—even when represented by binary coding in a computer; even when executed by the successor to the calculator.

Code And The Constitution

We know that computers pose a threat to our well-known constitutional rights. They threaten our privacy, our freedom from unreasonable search and seizure, our ability to speak without monitoring and censorship, and assemble without the chilling effect of electronic surveillance.

The threat is so serious that, in 1991, Harvard constitutional scholar Laurence Tribe, for the first time in his life, proposed an amendment to the Constitution to assure that, "This Constitution's protections for [the Bill of Rights' freedoms], shall be construed as fully applicable without regard to the technological method or medium through which information content is generated, stored, altered, transmitted or controlled."

It is becoming clear that he should have also included the protection of the freedom to continue to utilize the exclusively intellectual algorithmic functions of the mind.

What frightens and infuriates so many of us about software patents is that they seek to monopolize our intellectual processes when their representation and performance is aided by a machine.

What happens from the time a stimulus is input to the mind or a machine, through its arithmetic and logical processing by the mind or a machine, until a response is output from the mind or a machine—must be free from monopoly.

The government and the money-counters must not lock away from us our intellectual processes—not even when we execute them with the aid of symbols on paper, or performances on calculators, or programs in computers.

What occurs between stimulus and response, with no incarnation other than as electronic representation of binary logic and all of its algorithmic interpretations, must remain free.

The representation of an intellectual process—in a book, or source code, or binary electronic form—should be protected against unauthorized copying, but everything that performs similar to a thus-described and implemented process that is exclusively intellectual, simply must not be monopolized.

And that includes the representations or output created by computer programs when the primary purpose of such representations is the utilitarian function of communicating results for our further intellectual use—especially if they are anything less than amazingly novel and non-obvious.

What programmers do is figure out how to solve intellectual problems, rather than physical problems. And we represent our thought processes and their performance in software, rather than symbols on paper or key-strokes on calculators.

This nation would do well to think long and hard before it decides to grant monopolies over intellectual problem-solving.

One other precedent worthy of mention is the Constitution. It

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declares that the intent of intellectual-property protection is, "*To promote the progress of science and useful arts*, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." (Sec. 8, Par. 8, italics added)

The function is to promote progress by protecting the artistic and non-utilitarian works of authors through copyrights, and protecting the useful devices of inventors through patents. It says nothing about monopolizing intellectual processes—not even when they are mimicked by a machine designed explicitly to aid the intellect.

Everything that is represented or performed by software is first a completely detailed algorithmic intellectual process. There are no exceptions, other than by error.

> This nation would do well to think long and hard before it decides to grant monopolies over intellectual **problem-solving.**

Thus, I respectfully object to the title for these hearings—"Software-Related Inventions"—since you are not primarily concerned with gadgets that are controlled by software. The title illustrates an inappropriate and seriously misleading bias. In fact, in more than a quarter-century as a computer professional and observer and writer in this industry, I don't recall ever hearing or reading such a phrase—*except* in the context of legalistic claims for monopoly, where the claimants were trying to twist the tradition of patenting devices in order to monopolize the execution of intellectual processes.

(My next column will present the "Pragmatics" against software patents, and the final column will present a series of specific recommendations that I made, representing Autodesk, to the PTO Commissioner at that March, 1994, hearing.) ■

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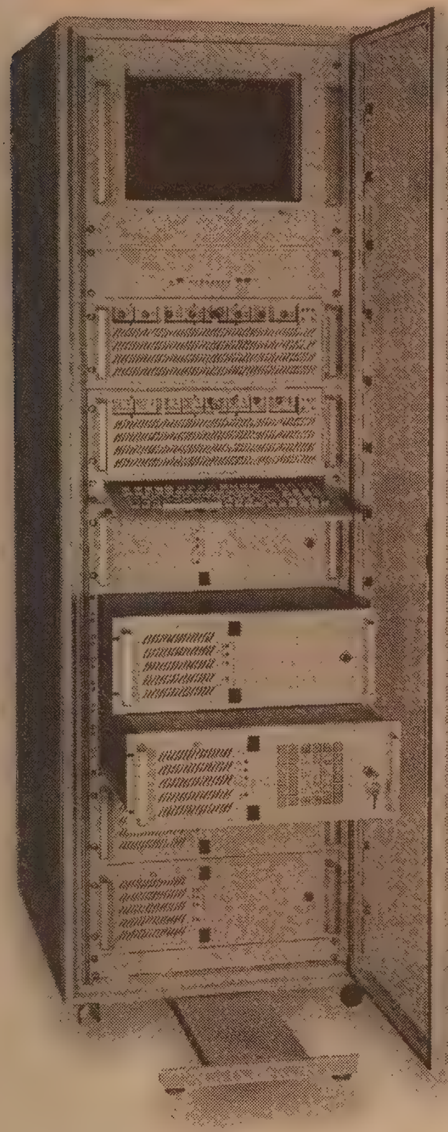

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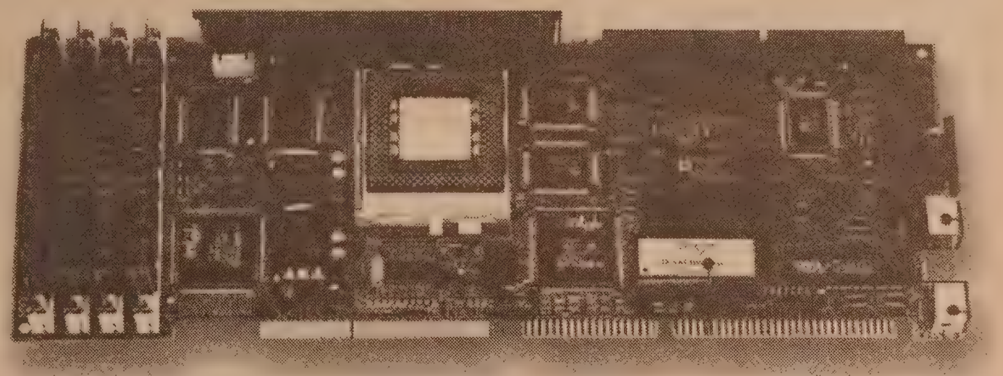

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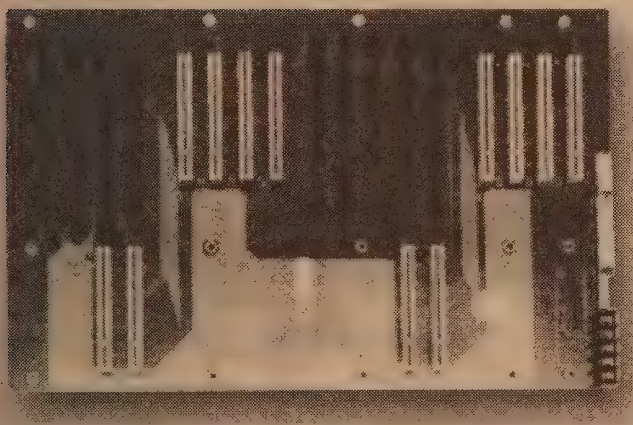

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When PC Cards (formerly known as PCMCIA cards) first debuted on laptop computers several years ago, I heralded this event as a major breakthrough. Peripherals could be easily connected to portable computers. There was finally a universal interface that could accommodate everything from memory cards to modems. Today, practically all laptops include PC Card slots and the number of uses for this interface continues to grow.

Unlike laptops, desktop computers generally lack slots for PC Cards. Over the years, I have yearned for a simple way to insert PC Cards into my desktop computer, giving my various peripheral devices greater portability along with the files I download onto a PC Card hard drive. In the early days of PC Cards, I installed a card slot in my desktop but found it was not the solution I had hoped for.

Last month, I received an announcement of a new PC Card reader for desktop computers, by Greystone Peripherals, and jumped at the opportunity to revisit this old dream. Greystone Peripherals' GS-320 CardDock installed easily into a 3.5" slot. You attach three ribbon cables to both the card reader itself and the control card. Insert the control card and secure the reader and you are pretty much on your way. The printed instructions told me to set a couple of jumpers, but it turned out that this was wrong. After I returned them to the settings that it shipped with, everything worked smoothly. Greystone said they are in the process of printing a new version of the manual, which will correct this mistake.

The CardDock is a great device. It lets you use up to two cards of almost any type. The bottom slot will hold either a Type I or Type II card. The upper slot will hold Types I, II, or III. This means that you could, for instance, insert a modem and a hard drive at the same time. I have seen only one laptop that provides this capacity.

At the same time I got the reader from Greystone, I received an announcement from Kingston Technology introducing a new 520MB Type III PC Card hard drive ($549). The Kingston hard drive can hold 1GB of data if you use data compression. I feel confident that even larger PC Card hard drives—at lower prices—are on the way. I thought this would be the ideal product to test with the card reader. Unfortunately, things did not go very well. The desktop computer did not recognize the Kingston hard drive. My phone calls to Greystone were unable to help me fix the problem. I then spent a long time with the technical support people at Kingston, who were both helpful and knowledgeable. After going down a few dead-end paths, they directed me to the folks at SystemSoft who make a product called CardWizard Pro for Windows 95 ($69.95). This software promised to solve all of the problems and, it turns out, is the same software that comes installed on many of the laptop computers sold today.

I wish the story ended here, but unfortunately this was just another beginning. When I first installed the card reader, my Kingston hard drive card did not show up as a drive letter on my computer. After installing CardWizard, for a brief moment things seemed to be working cor-

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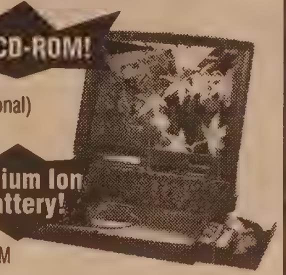

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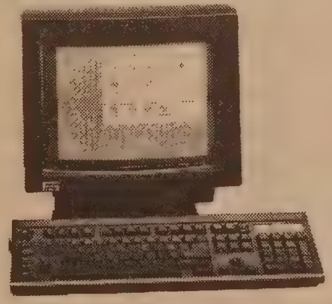

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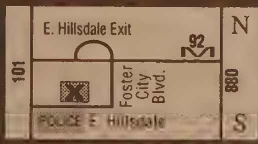

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Laptops *continued...*

rectly. I decided to try another PC Card product, a hard drive that connects PC Card Type I card through a cable. The Greystone reader simply did not recognize it. I spent more time with technical support for the second drive, who finally decided it was defective and mailed me a replacement that behaved exactly the same.

In the course of trying to install this new hard drive, I was urged to uninstall the CardWizard software. For the next week, I went around-and-around with technical support people from SystemSoft, Greystone, and ultimately, Microsoft to determine why the various devices would not work. After I would get one part of the equation figured out, another element would fail. I spent the better part of a week trying to unravel the knot.

Microsoft emailed me some replacement files that they thought might solve the problem. At one point Microsoft suggested I reinstall Windows 95, thinking that perhaps something had become corrupted in my system. I then thought that perhaps there was a virus, so I checked my system for viruses. All to no avail. In the end, we all came to the conclusion that perhaps my problem was a hardware limitation of my system.

As I write this, I am about to install a new motherboard in my desktop computer. Mind you, I am not going to all this trouble just to get a PC Card reader working. Rather, I have learned that every couple of years I need to do a serious upgrade of my desktop system to be able to test the products as they are introduced. My general rule of thumb is that after a couple of dead ends, I upgrade. Now is the time to bite the bullet. My generic 486 computer, with all of the upgrades I could coax into it, simply has limitations that I cannot overcome. While my system will continue to function for years doing its primary job of running my favorite software, it will not let me work with upgraded hardware and software beyond a certain point.

In next month's column, I will revisit the saga of getting this PC Card reader and various cards to work together as designed. I feel confident that with up-to-date hardware all of the problems I have encountered will have been avoided. We shall see.

RESOURCES:

CardDock GS-320 Reader, $139
Greystone Peripherals, Inc.
130-A Knowles Dr.
Los Gatos, CA 95030
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DataPak 520 PC Card, $549
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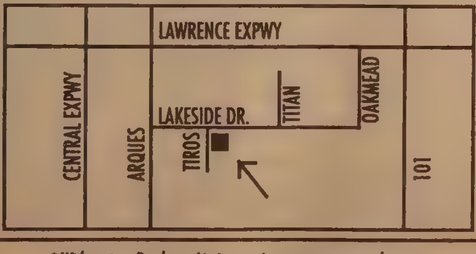

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Computer Of The Month

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Tatung, a Taiwanese computer maker, recently decided to increase its presence in the US notebook market. Its flagship model is the TNB-5600. Computer design has advanced to the point that anyone can now make a decent notebook. Tatung's entry has everything that you would expect and a little more. CPU configurations are available ranging from 150MHz up to 200MHz. The system I tested included a Pentium 166MHz processor with MMX. It came standard with 16MB of RAM, expandable up to 64MB. Upgrading to 32MB costs $199.

Tatung includes a variety of extras, such as a 33.6Kpbs fax/modem and an attractive carrying case. The street price of around $2,500 puts the computer within reach of many entry-level buyers. The TNB-5600 is very sleek: It is just over 1.5" thick, roughly a 9" x 12" footprint, and weighs a little over 6 lbs. without the battery or 7.5 lbs. with the battery. Whereas other computers with similar dimensions may weigh considerably less, this notebook is packed with features.

It comes with a removable hard drive, ranging from 1GB up to 2.16GB. These days, a CD-ROM drive is more important than a floppy drive. Accordingly, a 10X CD-ROM drive is installed in the drive bay. You can swap this out for a floppy drive, but Tatung has made it easier to just attach the floppy drive through the printer port. That way you can use the floppy drive on those rare occasions when you need one and detach it when you are finished. The CD-ROM cannot be used as an external drive. Tatung believes, and I agree, that you need the CD-ROM drive more often than a floppy drive.

The keyboard offers a pretty standard layout. The function keys control many things, such as brightness and contrast as well as loudness of the speakers. While the keyboard is good, my preference is still for a full-size keyboard when I am working at my primary location. It is easy on this computer to attach a keyboard to the PS/2 port on the back. In lieu of a mouse, Tatung uses a touchpad. Again, when I am not on-the-go, I prefer to use a mouse, which can be attached through the same port as the keyboard. A Y-connector cable is included that lets you attach both an external mouse and a keyboard. I like Tatung's design that still lets you use the built-in keyboard even if an external keyboard is attached. There are times when you need to access some of the function keys that don't appear on conventional keyboards.

The active-matrix display measures 12.1" diagonally and is crystal clear, supporting SVGA. An 11.3" dual-scan display is also available. With either choice, you can attach an external monitor through the video port on the back. A function key toggles between the LCD and an external monitor. You can have both on at the same time.

A nickel metal hydride battery shipped with the notebook I tested, although lithium-ion batteries are available and will give better performance and hold longer charges. Tatung says a charge on the NiMH battery will last up to three hours. Extra batteries are available for $99.

As with most notebooks these days, full multimedia support is standard. The TNB-5600 has a built-in microphone and speakers as well as the ability to let you use an external microphone or connect another sound signal through the line-in port. Likewise, you can bypass the built-in speakers and connect an alternate set through the line-out port.

In addition to the serial and parallel ports, there are two PC Card slots. You can load up to two Type I or II cards or a single Type III card. I had no trouble configuring devices to work through the PC Card slots. Another way of transferring data is through the infrared connection that transfers files to other similarly equipped devices.

The TNB-5600 is one of the few notebooks I have seen with a game port, which also doubles as a MIDI port. Tatung also includes a USB port on the back. While I read a lot about USB, (a port that accepts a wide range of peripherals), I had yet to encounter one in the flesh. An S-video jack lets you send the computer signal to a television. ■

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RESOURCES:

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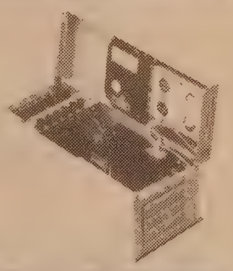

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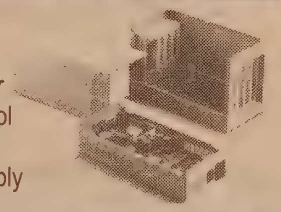

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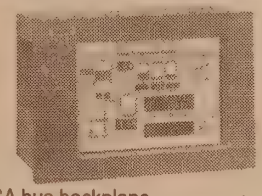

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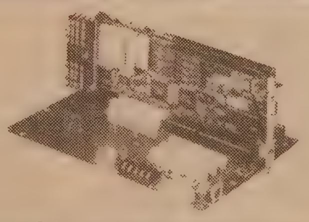

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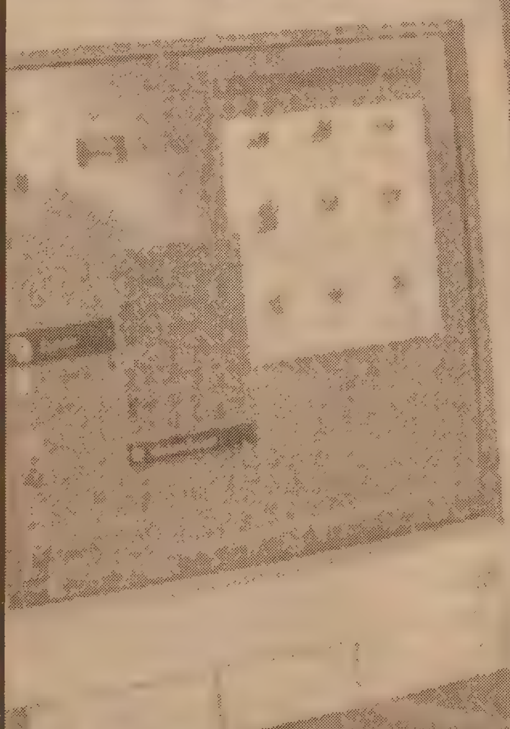

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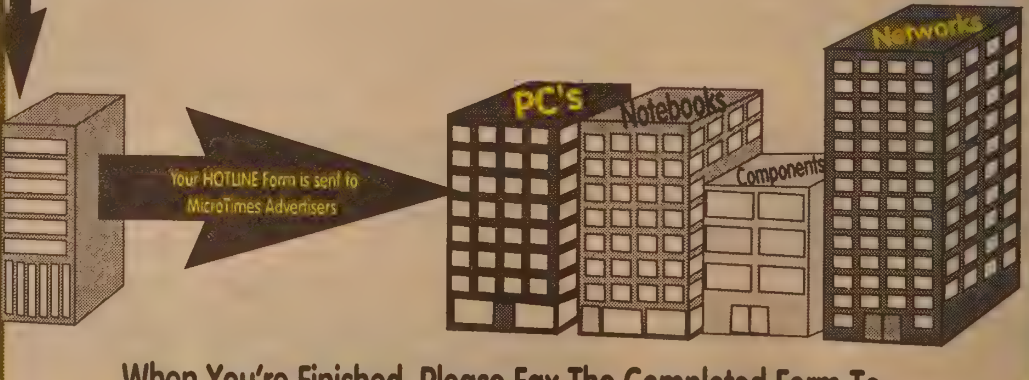

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○ 10 to 50 ○ Over 100

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○ 266 ○ 233 ○ 200 ○ 180 ○ 166 ○ 150 ○ 133 ○ 120 ○ 100

BUS TYPE ○ PCI ○ VLB ○ EISA ○ ISA

CACHE ○ 64K ○ 128K ○ 256K ○ 512K

RAM: ○ EDO ○ SRAM ○ 4MB ○ 8MB ○ 16MB ○ 32MB ○ 64MB ○ 128MB

MONITOR: ○ SVGA ○ VGA ○ MONO ○ 26 DPI ○ 14" ○ 15" ○ 17" ○ Non Interlace ○ 28 DPI ○ 20" ○ 21" ○ Multisync

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VIDEO CARD RAM ○ 512KB ○ 1MB ○ 2MB ○ 3MB ○ 4MB

POINTING INPUT DEVICES: ○ Any Mouse ○ MS Mouse ○ Keyboard
○ Serial ○ Bus ○ PS2 ○ Trackball ○ Joystick ○ Ball Point ○ Pen

OPERATING SYSTEM NEEDED: ○ Windows 95 ○ OS2/Warp ○ Win NT ○ Mac ○ UNIX ○ DOS/Windows 3.11

STEP THREE: MULTIMEDIA UPGRADE ○ Please Add To Step 1 & 2 Quotation ○ Please Quote Me Separately

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CD ROM Brand Name and Model Number

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STEP FOUR: NOTEBOOK SECTION - Please Note You Must Make Choices In Steps 1 & 2 To Complete Step 4

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Pictures And Words

The Gurus On Interfaces

The Gurus on vacation sat around a table in the air-conditioned Cactus Cafe, sipping the only cappuccinos available in San Angelo, TX.

Between sips they divided their attentions between fate and the breakfast menu, neither of which was particularly encouraging. Their palindrome project had come to naught and their most recent contract work involved telephone support for novice Windows 95 users. The breakfast menu featured eggs sixteen different ways, bacon, sausage, biscuits with gravy, and "fruit."

Looking out at the waves of heat radiating off of the pavement outside, Baba Vladimir said: "It's time to overthrow the tyranny of the visual."

"What?" Baba Bob said.

"The tyranny of the visual: It's time to throw off the tyranny of the visual!"

"I heard what you said," Bob replied, "I just don't have a clue what you're talking about."

"The Windows thing," Vlad offered. "You know: Graphical User Interfaces. I've given this a lot of thought: They're instruments of the tyranny of visual."

"Ooookay."

"Look, virtually every computer that anyone uses these days has a Graphical User Interface. Everything that you can do on the computer is represented by a picture or an icon of some kind. Opening an icon presents the user with a window, which in turn has its own visual controls: buttons, menu bars, tool bars, and the like. The user manipulates all this stuff with mouse clicks."

"Yes, Vlad, we all know how that works."

"Ah, but we don't *all* know how it works. GUIs are supposed to give the user intuitive visual cues that make the computer easier to use. But what happens if the visual cues, the pictures, aren't intuitive?"

"I give up. What happens?"

"What happens," Vlad explained, "is that the computer becomes a total mystery to the user and we spend six weeks on the phone trying to explain things that the interface designers assumed would be obvious.

> **"The Windows thing," Vlad offered. "You know: Graphical User Interfaces. I've given this a lot of thought: They're instruments of the tyranny of visual."**

"And because the user interface is picture-based, we can't just tell the beleaguered user which command to execute. We have to get them to describe what they see on the screen, because we can't see it. Describing the display that a GUI puts up is an immensely difficult task for novices because there are a lot of things on the screen and new users don't know what's important and what's not. Then we make a guess about what's really on the screen and try to steer them through a dense forest of buttons, icons and bars. Oh, my!"

"And what, pray, tell, is the alternative?"

"Words."

"Words?"

"Yes, words! Command line interfaces. They're easier to support because the commands on a command line are kind of like words. They resemble the language that human beings use to communicate. They can be read and spoken (or at least spelled) more or less unambiguously. When a user reports a problem, you ask them what command they typed in. They tell you, you spell out a corrected command, remind the user to press RETURN, and wait for the results."

"Vlad, don't you think it's the tiniest bit weird to choose a user interface because of its supportability?"

"Well, since I do the support, no, I don't think it's weird at all! And frankly, the people on the other end of the phone who call in for support wouldn't think it so weird either."

"Oh, come on. Surely there are more important criteria for judging user interfaces. What about usability?"

Culinary Culture Clash

"What about breakfast?" a twangy voice interjected. The gurus turned to see their waitress. "Y'all ready for sump'n' to eat?"

"Ah, breakfast, yes," Vlad said, welcoming the interruption. "We need some breakfast. Do you have any fruit?"

"Heck, yes we got fruit. It's right there on the menu." She glared at him over the television-shaped lenses of her glasses.

"Pardon my friend, ma'am," Bob intervened, "He's just trying to overcome the tyranny of the visual."

"What?"

"Never mind. What kind of fruit do you have?"

"Y'all like cantaloupe?"

continued on page 56

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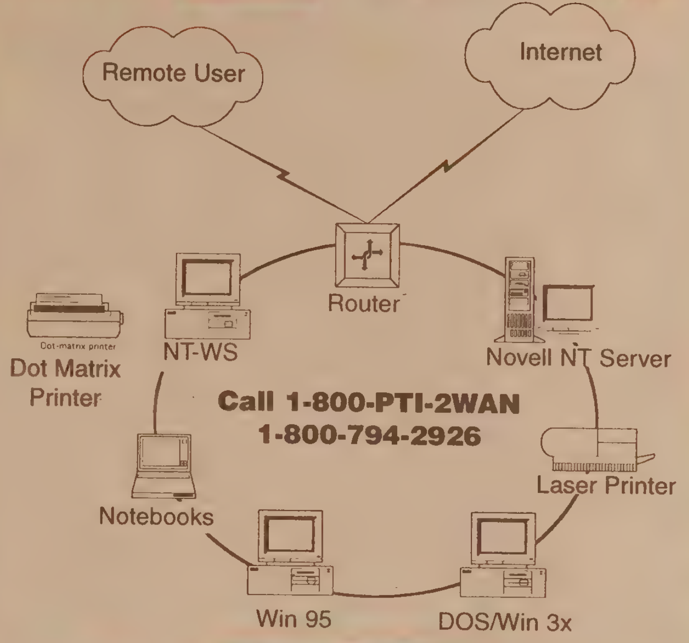

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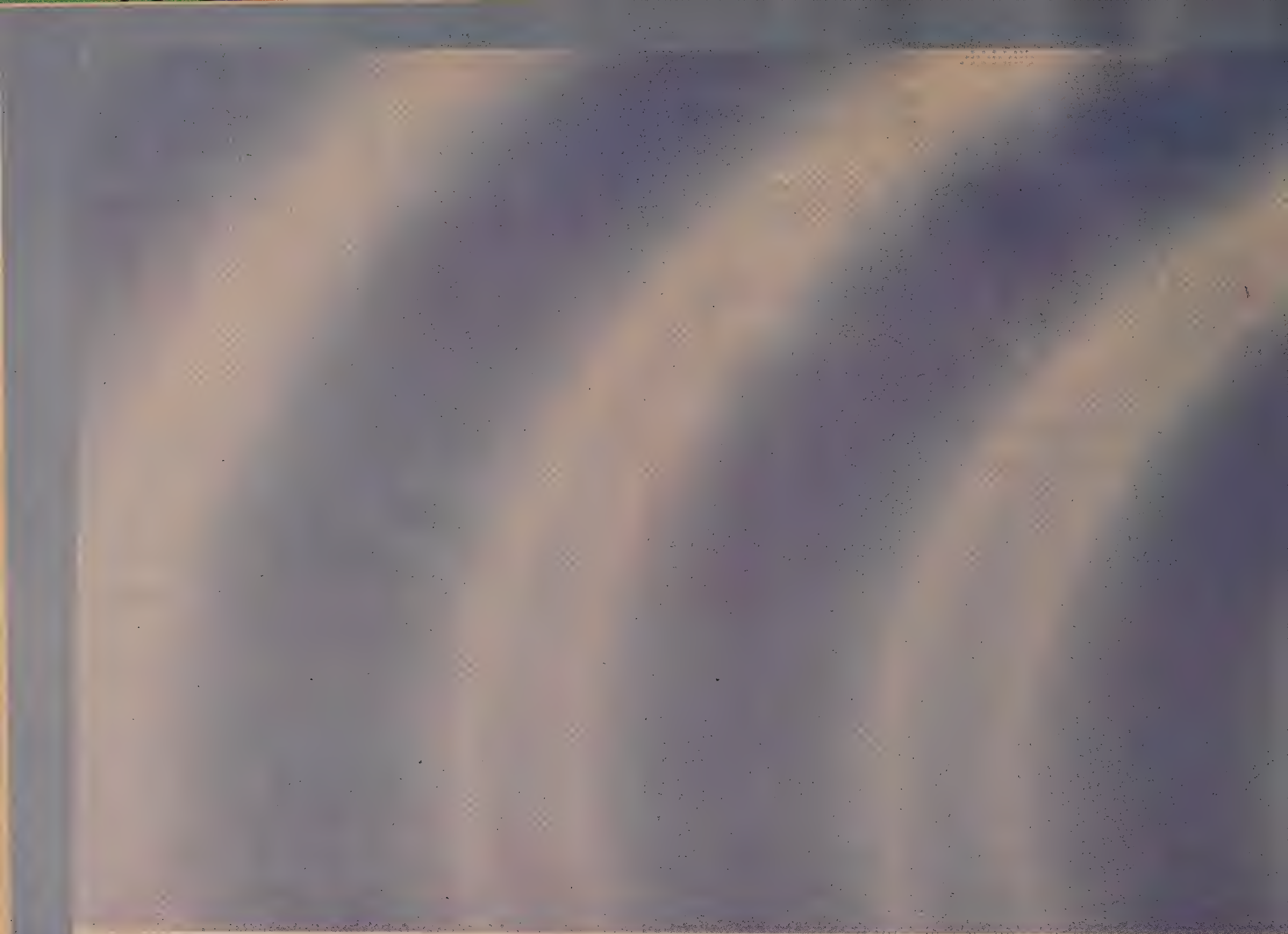

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PROCESSOR

UNIX *continued from page 52*

"Cantaloupe would be fine," Bob smiled.

"You want a little gravy on that cantaloupe?"

"Excuse me?" Bob's smile vanished abruptly.

"Gravy, Hon. You want some gravy on your cantaloupe?"

"Now that," Vlad interjected, "is definitely not on the menu."

Bob was incredulous. "People around here eat meat drippings on fruit?"

"Some do, some don't, Hon. We get all kinds in here. You want some o' that gravy or not?"

"Uh, hold the gravy. We'll take two orders of cantaloupe and another round of cappuccinos."

"Sure thing." And off she went.

Tyranny Of The Visual Revisited

"And that," Vlad mused, looking out at the street again, "leads me to another point about the tyranny of the visual."

Bob shot Vlad an exasperated look that went unnoticed.

"What if," Vlad continued, "your computer can do things that aren't (or can't be) represented in its Graphical User Interface? With a Graphical User Interface, you can't use what you can't see, and the things you can't see might as well not exist."

"And what exactly would these 'things you can't see' be?"

"Things," Vlad continued, scribbling on a napkin, "like this."

On the napkin, was a string of UNIX commands:

```
grep Smith /etc/passwd | grep csh | sort > smith.out
```

Bob frowned at the napkin. He recognized that the commands Vlad had written down would first search the UNIX password file for users named "Smith." Entries that satisfied this search would then be passed to the second command that looked for the pattern "csh" (the name of the C-shell executable). The results of this command would in turn be handed to the sort command and the resulting sorted list of users named Smith who also used the C-shell would be put into a file named "smith.out."

"Oh, come on, Vlad. Most GUIs have some way of searching a file for a pattern or sorting the results."

"True enough," Vlad conceded, "but most GUIs don't have a way to string together multiple commands or to redirect the output of a command to a file.

"GUIs in general are set up to isolate individual commands and to treat the output of a command as something the user wants to see. Sometimes that's exactly what's needed.

"But it's not *all* that is needed. Sometimes the output of a command is data, something to be used rather than viewed. In the UNIX shells, the 'pipe' convention allows the output of one command to be connected to the input of another. Command output can also be 'redirected' into a file. With pipes and redirection, it's possible to combine a number of commands to do more complicated things than can be done in a single command.

"And that is what's missing in most GUIs. I think it has something to do with usability."

The waitress arrived, distributed the cappuccinos and cantaloupe, and turned to go.

"Excuse me," Vlad called. "Could we have a side order of gravy?" ■

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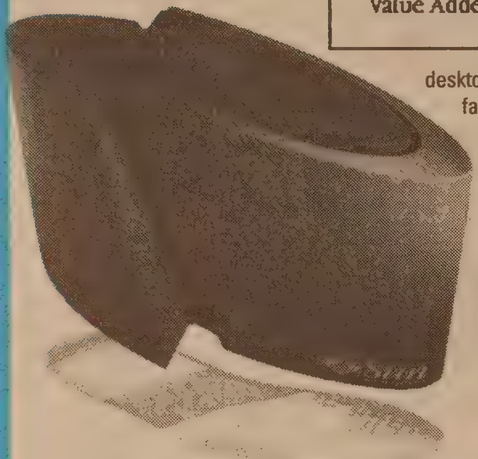

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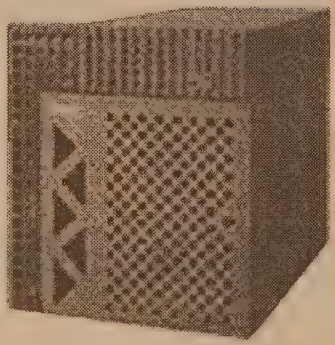

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BY ROBERT MOSKOWITZ

Licensing Writers

L.A. Law Has Creative Community In Uproar

It's funny how there are at least two sides to every issue.

Here we have the City Council of Los Angeles, scrambling desperately to increase the city's income, and therefore finding merit in a new law designed to legalize the activities of thousands (or tens of thousands) of people operating businesses out of their homes. The tradeoff? The city wants these entrepreneurs to register, pay a licensing fee, and then pay taxes on the gross annual income from home-based business operations.

But hold on a second, say outspoken members of the city's rather large creative community. You can't license artists and writers, any more than you can license clergy. It's downright unfair, unjust, and prejudicial. What's more, it's unconstitutional.

The result has been to convert a simple, long-awaited city ordinance that would legalize home-based businesses from a routine matter to a major fracas. Initially, it appeared the law was a genuine attempt to reflect the realities of telecommuting and other modern, decentralized ways of working. But the ultimate outcome may simply be to drive creative and energetic entrepreneurs outside the city limits of Los Angeles.

Part of the reason the new Home Occupation Ordinance is generating so much press attention is that some of the larger writers' organizations got involved in the protest. These organizations have the inclination, the know-how, and the budgets not only to call attention to an issue, but to very literally make a federal case out of what the Los Angeles City Council hoped would remain a local matter.

On September 8th, for example, the Writer's Guild of America filed a lawsuit asking for a restraining order against enforcement of the Home Occupation Ordinance. If the local courts won't grant a restraining order, the WGA has vowed to appeal the case to the federal level, and perhaps beyond, in a dogged attempt to get a favorable verdict.

But who can blame them? It's difficult to deny that Los Angeles' attempt to put a licensing requirement on writers appears to violate the First Amendment of the US Constitution, which guarantees freedom of expression, and freedom of the press.

As written, the law says writers are business people and must annually obtain a $25 permit and be taxed on gross income. But according to Marvin Wolf, president of the writers' organization called Independent Writers of Southern California, the ambiguity of the ordinance's wording creates the real possibility that city bureaucrats could deny a license to a writer who doesn't satisfy some unspecified criteria. The effective result would be that individual writers could be found guilty of writing without a license, and fined or even jailed by the city for doing so.

> Initially, it appeared the law was a genuine attempt to reflect the realities of telecommuting and other modern, decentralized ways of working. But the ultimate outcome may simply be to drive creative and energetic entrepreneurs outside the city limits of Los Angeles.

There are many practical problems with Los Angeles' Home Occupation Ordinance (see sidebar), but most writers agree that the biggest issue is the city's right—or lack of a right—to license creative professionals, whether they are working out of their homes, or out of an office or storefront.

According to the Writers Guild of America, the new law creates constitutional problems at least five ways:

- The Constitution forbids requiring that writers who work in their homes obtain a permit or a license to write.
- Enforcing the ordinance by inquiring into—for example—whether a particular work was written at home or on vacation in Europe, is an invasion into the creative process forbidden by the First Amendment.
- The ordinance violates writers' constitutional right to work anonymously.
- The ordinance violates Supreme Court decisions that prohibit unequal taxation of creative work, by differentiating between writers who sell to different media, as well as between writers who work for studios full-time and those who work freelance, even if both work at home.
- The ordinance opens the door to city censorship of writing done at home by barring any writing at home for "adult entertainment."

Creative expression is a constitutionally protected activity, they argue, and no level of government may be allowed to force those practicing it to obtain a license. This restriction may prove to be tough luck for the city, but Los Angeles' need for extra revenue isn't a compelling enough reason to warrant a breach of the fundamental document of these United States.

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Licensing Writers *continued...*

History

The Los Angeles Home Occupation Ordinance comes out of a mid-'80s realization by the city fathers that revenues were falling far short of expenses. There began a continuing search for new sources of revenue—user fees, permits, business licenses, and other subtle forms of city taxation.

From the beginning, home-based businesses were considered a very good target for new taxes. Something akin to the Home Occupation Ordinance was first introduced early on, but nothing along these lines was actually passed until March of 1987. Until then, anyone operating a business out of their home or apartment could be shut down if and when neighbors complained. But the city received very few complaints, and the city's home-based entrepreneurs slept soundly, without fear of law enforcement action against their technically illegal sources of livelihood.

The new Home Occupation Ordinance was trumpeted as a way to legalize home-based businesses. But the hidden agenda of the City Council was to create a basis for Los Angeles to license, regulate, and tax these Mom-and-Pop operations. The Ordinance initially required newly licensed home-based business owners to pay three years' worth of retroactive license fees and gross-income taxes. When that proposal didn't fly, the city declared a six-month amnesty period during which owners of home-based businesses could register without having to pay any back taxes at all. But that same re-write of the ordinance somehow created the new requirement that writers be included, a provision that now appears to have sunk the whole revenue-generating ploy.

When A Tax Is A Burden

In theory, there's no reason why writers should be exempt from an income tax on gross proceeds, just like other businesses now licensed in the city of Los Angeles. But the practical fact of the matter is that the Home Occupation Ordinance is so poorly written it creates additional hardships on just the kind of businesses—those with sporadic income and high expenses—that writers are likely to be running.

Not that the previous law was any more logical or fair-minded. For example, collection agencies and advertising agencies pay different license fees and tax rates, although nobody can say precisely why.

Under the new law, a writer must pay the business license fee and the tax on gross proceeds even if he or she has earned that money doing some or all of the necessary research and writing "on location" away from the city.

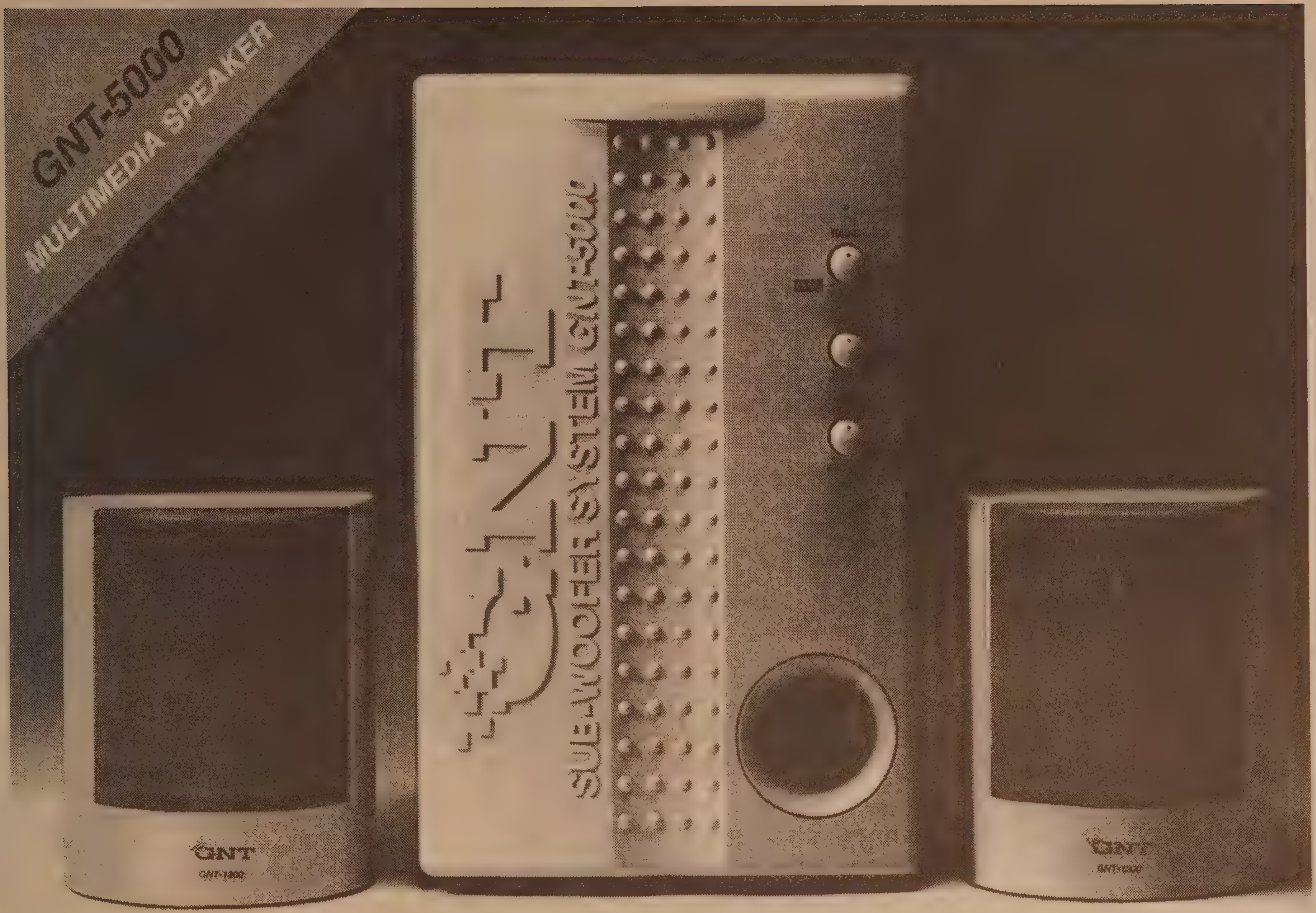
Here's the actual schedule of taxes within the Ordinance for various categories of writers:

1) Radio and television writers must pay $110.86 per year on the first $75,000 or less of gross receipts, and $1.48 per year for each additional $1,000.

2) Film writers must pay $106.43 per year for the first $18,000 or less of gross receipts, and $5.91 per year for each additional $1,000.

3) Multimedia writers must pay $118.25 per year for the first $100,000 or less of gross receipts, plus $1.18 per year for each additional $1,000.

It may not seem like a lot of money, until you notice that you must pay the minimum amount even when you earn only a dollar in that category of writing!



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Licensing Writers *continued...*

Other cities in California, including Long Beach and Santa Monica, have laws on their books that are very similar to the Los Angeles Home Occupation Ordinance. But they make no effort to enforce them, and even hope that no one notices they have such laws. West Hollywood, at the other end of the spectrum, has a law that specifically exempts creative professionals from any kind of city-based licensing or taxation ordinances.

"I hope Los Angeles doesn't spend money to defend the Home

continued on page 66

Other Impractical Aspects

THERE ARE SEVERAL OTHER IMPRACTICAL ASPECTS TO THE HOME Occupation Ordinance, as currently written.

For example, the law states that a writer needs a separate license for each business he or she is in—with a maximum of two business licenses permitted. That wouldn't be so bad, except that the law also states that selling a written manuscript to a company puts you in the same business as that company.

Think for a minute about the unfairness of this approach. If a hardware store sells materials to a contractor building a house, and also to a plumber repairing existing installations, no one thinks the store is in two different businesses. It's clearly in the one and only business of selling hardware. But if you're a writer selling articles to magazines, books to publishers, and scripts to TV or the movies, the Los Angeles Home Occupation Ordinance says you're in three different businesses, and since you can only be licensed for two, you must give up one of your occupations.

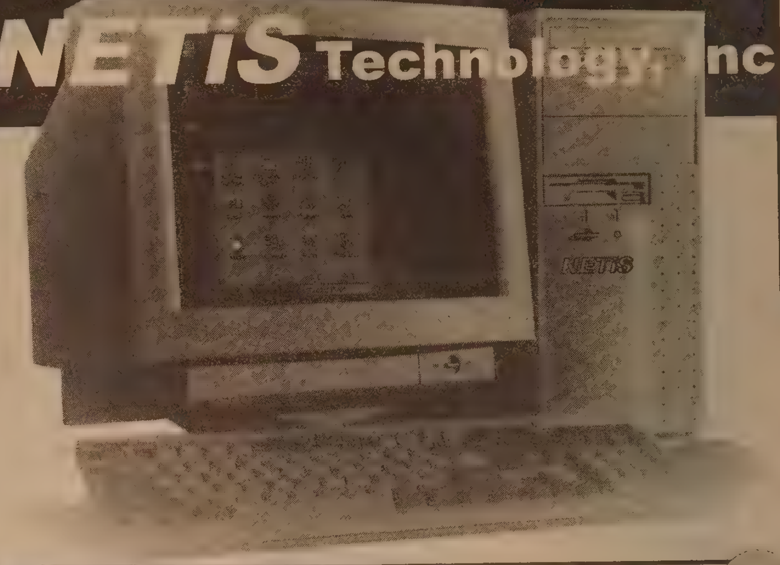
Since most people trying to make a living at home as a wordsmith tend to write for many different clients, often providing written materials for several different "businesses," the new ordinance effectively limits a Los Angeles-based writer's ability to survive. It's like telling Picasso he could paint, or draw, or sculpt, or make pottery, but not all four—at least not in Los Angeles.

What's more, IWOSC's Wolf points out, the city's assertion of the right to issue a license automatically gives it the right to send an inspector to a writer's home. The inspector is technically empowered to come in and check not only that you're complying with the Home Occupation Ordinance, but with all other applicable laws, city building codes, and so forth. City officials have denied any interest in sending inspectors out to home-based businesses, but this is cold comfort to most writers, who enthusiastically invoke the specter of Big Brother whenever the subject of licensing writers comes up.

As a practical matter, Wolf asserts, a writer who irritates a big-wig down at City Hall runs the risk under the new law of suffering serious harassment in his or her own home, and may even be put out of business as a writer.

Finally, many writers believe that their individual creativity and expertise form the real foundation on which the highly successful movie and television industries rely, and on which the Southern California economy thrives. So they resent being asked to pay new taxes on gross income while DreamWorks and the other megabucks studios receive millions in tax deductions, tax holidays, and other forms of tax relief.

—Robert Moskowitz



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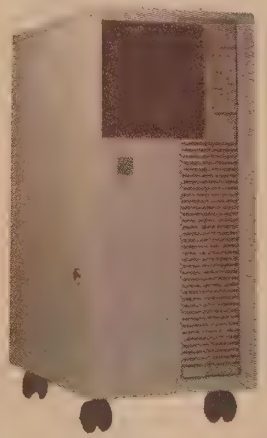

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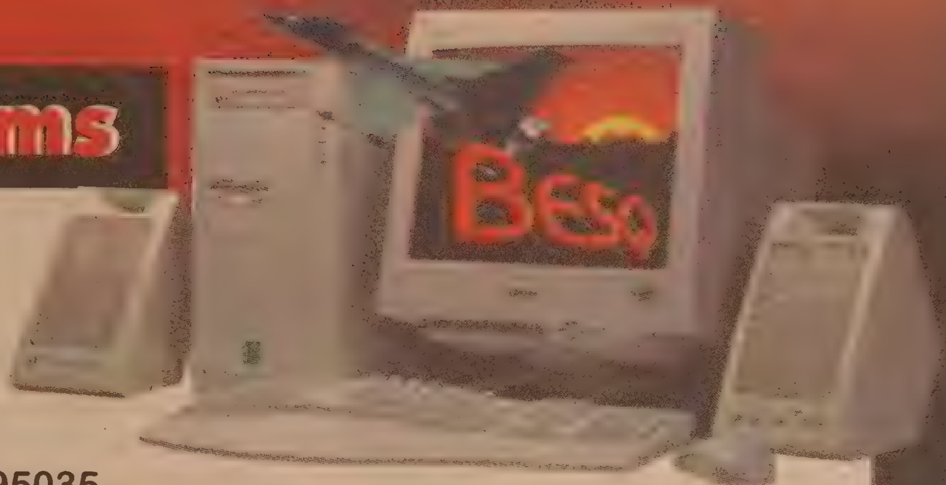

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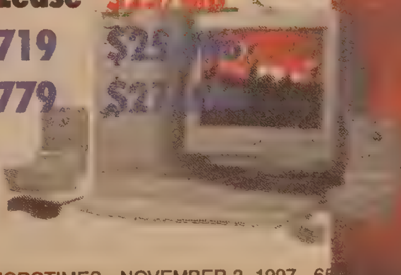

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continued from page 62

Occupation Ordinance in court," IWOSC's president, Marvin Wolf says, "because it's a constitutional issue and they cannot possibly win. It's criminal for Los Angeles—which claims to be desperate for funds—to fight this battle. The money would be better spent teaching the people who run City Hall to read the Constitution."

A better-written law for the city would probably eliminate any licensing requirement for the traditional constitutionally protected occupations—writers, artists, and clergy—and would also replace an unfair tax on the gross revenues of home-based businesses with a more fair-minded income tax on everyone living or doing business in the city, not just people who happen to work at home.

A Big "Never-Mind"

While the argument rages, Los Angeles City Attorney James K. Hahn may have already taken steps to resolve the issue to everyone's satisfaction, however. On September 12th, he penned a memo stating his official opinion that home-based businesses with zero impact on their neighborhoods—in terms of signage, advertising, package deliveries, customer visits, employees, unwanted smells or sounds, trash and sewer outflow, and the like—are not required to obey the Home Occupation Ordinance. Technically, his memo calls this category of home business an "accessory use" of the premises and not a separate "land use" requiring a permit.

> The new Home Occupation Ordinance was trumpeted as a way to legalize home-based businesses. But the hidden agenda of the City Council was to create a basis for Los Angeles to license, regulate, and tax these Mom-and-Pop operations.

If this opinion is accepted by the City Council in a vote scheduled for early October, Los Angeles will voluntarily refrain from enforcing the Home Occupation Ordinance not only against writers and other creative professionals operating out of their homes, but also against accountants, data-entry clerks, and others who can operate successfully using little in the way of city services.

But this change of heart—or at least of interpretation—may not stop the Writers Guild's lawsuit. The problem, Guild attorney Barry Bostwick says, is that "nobody" knows where to draw the line between an accessory use and a separate use requiring a city license.

For the latest information about the status of the Ordinance, you can call the Writers Guild Hot Line at (213)782-4560, or check their Web site at *http://www.wga.org*. ■

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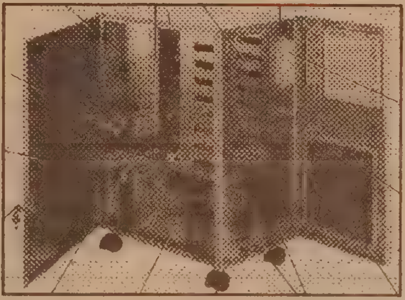

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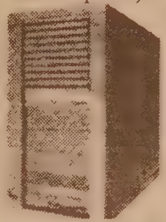

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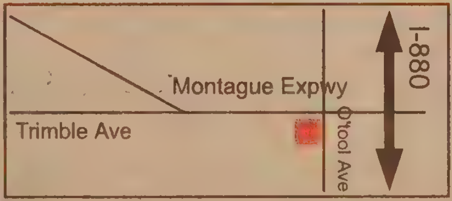

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Things That Don't Work

The Story Of One Support Call

Like every other small-office user, from time to time I need something to work in a hurry, and it doesn't perform. Most of us just have to fume, but I have the good fortune of being able to tell all.

While preparing my column for this month, I happened on what might be a case of Internet fraud. It was a unique case, something that actually would have been breaking news. Confirming the story involved telephone calls and faxes to law enforcement officers in Texas. Alas, my WinFax Lite software didn't work with my spiffy new 3Com/US Robotics Sportster 56Kbps modem. I decided to install RapidComm, the data and fax software that came with the modem.

I put the CD from 3Com into my CD drive and clicked on a likely looking execute program. Up came an unintelligible screen, with dozens of offers, none an obvious path to installation.

But I worked on it for a while, and under one of the buttons, between various offers of Internet software, I finally found a button that offered to install RapidComm. Wonder of wonders, it did install the software, and I was able to run the RapidComm program fairly easily.

Then I closed it, and opened Microsoft Word for Office 97. I found the document I wanted to fax, and opened that. When I chose RapidComm as my printer, however, it crashed Word for Windows. I did this a couple of times, with identical results.

The Phone Tree

No problem, thought your correspondent, I will just call 3Com and find out what the problem is.

The first thing that happened was that I got a phone tree. Like all callers, I thought my problem was important. I wanted to talk with a live technician so I could solve my difficulty and get on with my interrupted story. But 3Com wanted me to listen to their messages. "To improve customer service..." Right. Here is a quite close transcript of what the phone tree had to say:

"Thank you for calling the customer support department of 3Com. To improve customer service, please note that our phone menu and prompts have been changed. To assure quality service, your call may be monitored. For parts sales or to check status of an existing service repair order, press one. If your modem is operational please use our online services by pressing two on your phone now. If your modem is not operational, or if this is an original installation, please press three. To repeat this message, press pound."

I pressed three.

"To check your modem's supervisor date code revision for potential upgrading, press one. For product technical specifications, press two. For technical support on US Robotics products, press three. To hear these options, press the pound sign. To return to the previous menu of options, press star."

I pressed three.

"For technical support on Sportster modems, press one. For Big Picture video products, press two. For PCMCIA products, press three. For 24-hour-a-day, seven-day-a-week automated support, press four. To hear these options again, press the pound sign. To return to the previous menu of options, press star."

I pressed one.

"If you are calling from Canada, press one. Otherwise stay on the line."

I stayed on the line.

"So that we may serve you more efficiently, please enter one of the following numbers: your serial number, a previous product repair number, or your home phone number."

I entered my home phone. "That number is not in the database. Please note that this number is for support of US Robotics products only. Please stay on the line."

I did.

"Thank you for holding. We appreciate your patience. Our automated support system may be able to help you. Available 24 hours a day, seven days a week, this system answers many frequently asked questions in just a few minutes. For automated support, press one now. US Robotics also offers a no-hold 900 number. The charge is $1.50 per minute, and it is available Monday through Friday, 8 am to 6 pm. For no-hold support, call 1-900-555-USR1. That's 1-900-555-USR1. Otherwise, please remain on the line for the first available representative." Music followed.

No one perished; everyone has problems occasionally. But I suspect that my experience is like that of thousands of other people who call support lines. They just don't get to write columns about it.

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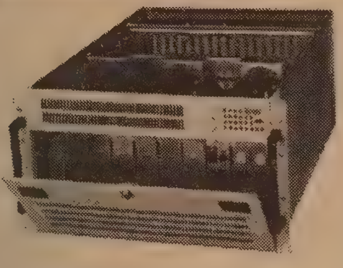

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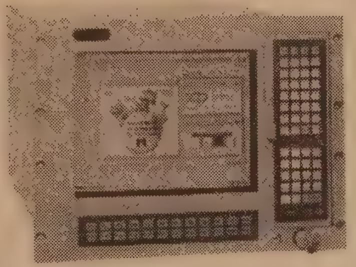

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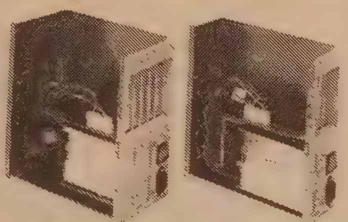

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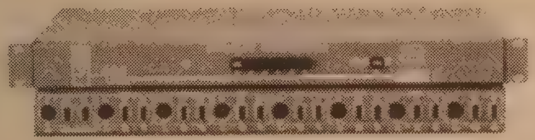

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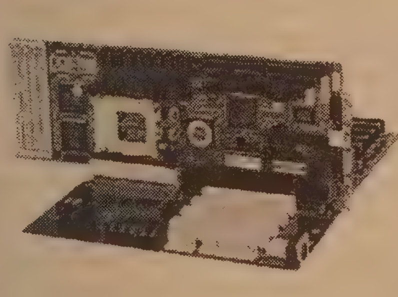

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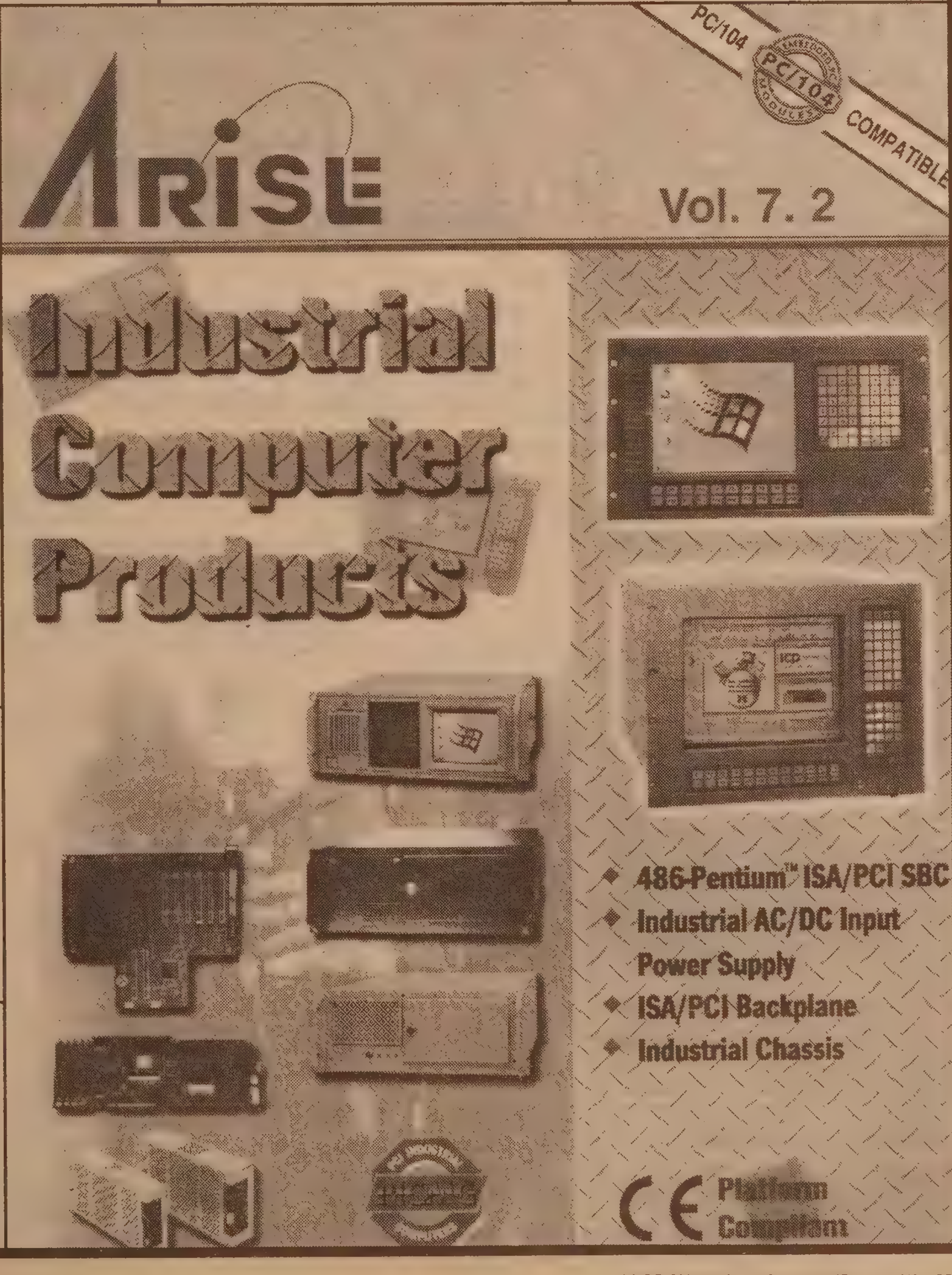

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Music followed some more, for some minutes.

"Thank you for your patience. Please remain on the line for the next available representative."

More music for more minutes.

"Thank you for holding. We appreciate your patience. Our automated support system may be able to help you. Available 24 hours a day, seven days a week, this system answers many frequently asked questions in just a few minutes. For automated support, press one now. US Robotics also offers a no-hold 900 number. The charge is $1.50 minute, and it is available Monday through Friday, 8 am to 6 pm. For no-hold support, call 1-900-555-USR1. That's 1-900-555-USR1. Otherwise, please remain on the line for the first available representative." Glad to hear that again.

Live Support

At twelve minutes, a "first-level tech" answered. He asked for the information necessary to register me. He asked me the operating system. I told him the problem.

He said, "We don't support Office 97."

We got that straightened out. From minute twelve to minute forty-three he had me add and remove com ports, take the modem out and try to jumper it. (There were no jumpers in the package; they had disappeared when I had installed the modem.) Then he had me put the modem back into the machine, and it reinstalled itself. He suggested that I call the manufacturer of my computer. I told him that I was not going to do that, and that I wanted help with the product.

We got precisely nowhere.

At minute forty-three he told me I would have to be transferred to a "level two tech." There wouldn't be any hold time at all. He put me on hold and I listened to five minutes of music. Then the level-two tech answered. "Hold on for just a minute while I bring up your information," he said.

He then offered (it was minute 51) to call me right back, when I complained about the cost. He did.

We worked until hour 1:06, and he promised to call back at 9 am the next morning. In the meantime he asked me to de-install the RapidComm software, and to run Scandisk and Defrag on my computer. I did all those things. WinFax still did not communicate with other fax machines.

He called back at 8:50 am the next morning. I told him WinFax would connect, but not transmit. He gave me an initialization string. I tried it, and it didn't work. We re-installed RapidComm and configured it. It still crashed Word. Eighteen hours and forty-nine minutes after I first spoke with the support team, the second-level tech went to the database and found there was a patch for RapidComm, which (it turned out) had a known bug with Office 97 products.

Music followed some more, for some minutes. "Thank you for your patience. Please remain on the line for the next available representative." **More music** for more minutes.

The patch was available on the Web. He couldn't find out what the URL was, however, because all the Web pages were being re-organized from US Robotics to 3Com. He gave me what he thought might be the page. I went there and looked for the file, but it wasn't there.

A few minutes later I got a call back from the level-two tech. He offered to send me the patch, as an attachment to email. I should have it in thirty to forty-five minutes. Great, I thought. Would it need to be unzipped? No, he said. It is an .exe file. Just put it in the \windows\system directory.

In less than thirty minutes, the email did arrive. I put it in the \windows\system directory. Then I loaded Word and tried to print with RapidComm. Word crashed.

I went back into the \windows\system directory and, just for jollies, executed the little .exe file he had sent me. It unzipped itself. Right.

Again I loaded Word, and printed to RapidComm. It worked. Only twenty hours and thirty minutes after I had first attempted to use the fax software supplied with the 3Com/US Robotics Sportster 56Kbps modem, I had a working copy.

So What Am I Whining About?

No one perished; everyone has problems occasionally. But I suspect that my experience is like that of thousands of other people who call support lines. They just don't get to write columns about it.

Total cost of this transaction to me included one lost story. If that story had panned out, it might have been a major news item. There were many hours of lost time. I had four calls from California to Texas that did not go through, and a contact at the District Attorney's office in Houston who has probably decided I am too unreliable to deal with. There were fifty-three minutes of calls to Chicago, where 3Com's support resides. The telephone time was under twenty dollars, so I could face that. The lost story and the compromised contact were more serious to me.

Probably the most serious was the unrecoverable hours of time. Their loss meant that I could not attend an important meeting, that my story was backed up, and that I had no leisure time at all in what were scheduled to be my days off.

The technicians at 3Com were unfailingly courteous and pleasant, even as I grew more and more irritated. The first one didn't seem to know exactly what he was doing. The second took the initiative at several points to call me back, and he did make contact when (or even before) he said he would. He did email me the patch. Since we tend to judge people by the emotional quality of our contact with them, I emerged with an irrationally positive attitude toward the 3Com support team. I wouldn't want to rely on them for support, you understand, but I would enjoy having them over for a barbecue.

There remain a number of things I wonder about. I do not know why the first technician did not look up the information about RapidComm

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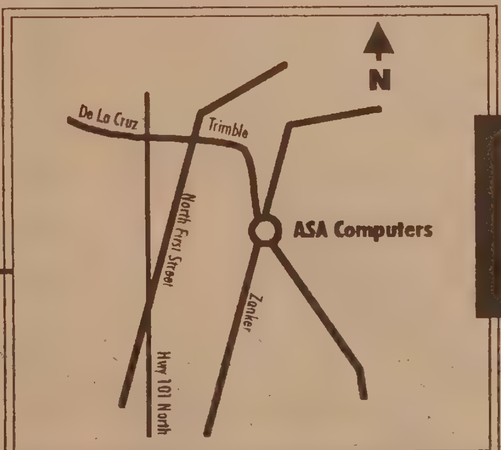

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Small Office/Home Office *continued...*

and the bug it had with Office 97 when I told him that I was using Office 97 software. I don't know why it took the second-level technician an overnight wait to do so. I do not know why the patch was not available at a known site on the Web. I don't know why I was told it didn't need to be unzipped when indeed it did need to be unzipped. I don't know why companies inflict phone-trees on their customers, guaranteeing that the customer is enraged before they actually speak to a live support person.

> **I don't know why** companies inflict phone-trees on their customers, guaranteeing that the customer is enraged before they actually speak to a **live support person.**

Every so often one needs to vent ...

And now for—

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- Mini tower case w/ 230W power supply
- 3-button serial mouse
- Win95 105-key keyboard
- P60W multimedia speakers
- Windows 95 installed
- 1-year warranty on parts and 5 years labor

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Pentium® 166MHz MMX™	$749
Pentium® 200MHz MMX™	$849

Pentium® MMX™ SYSTEM

- Intel® 430VX chipset M/B with 512K cache
- Pentium® 166MHz MMX™ w/ cooling fan
- 32MB 60ns EDO RAM
- Fujitsu 2.6GB Ultra DMA Hard Disk Drive (10ms)
- 1.44MB floppy disk drive
- Acer 20X IDE CD-ROM Drive
- Diamond Stealth SVGA card w/ 2MB RAM
- Sound Blaster compatible 16-bit sound card
- 33.6 fax modem w/ voice (rockwell chipset)
- Mini tower case w/ 230W power supply
- 3-button serial mouse
- Win95 105-key keyboard
- P60W multimedia speakers
- Windows 95 installed
- 1-year warranty on parts and 5 years labor

$879

Pentium® 200MHz MMX™	$981
Pentium® 233MHz MMX™	$1134

OFFICE SYSTEM SPECIAL

- Asusi 430TX chipset M/B with 512K cache
- Pentium® 166MHz MMX™ w/ cooling fan
- 32MB 60ns EDO RAM
- Fujitsu 3.5GB Ultra DMA Hard Disk Drive (10ms)
- 1.44MB floppy disk drive
- Acer 20X IDE CD-ROM Drive
- ATI 3D Xpression w/4MB SGRAM
- 16-bit Sound Blaster compatible sound card
- 33.6 fax modem w/ voice (rockwell chipset)
- ATX mid tower case w/ 235W power supply
- 3-button serial mouse
- Ergonomic natural keyboard
- P60W multimedia speakers
- Windows 95 installed
- Office 97 Professional Suite
- 1-year warranty on parts and 5 years on labor

$1079

Pentium® 200MHz MMX™	$1180
Pentium® 233MHz MMX™	$1323

NT SERVER/WORKSTATION

- Intel® 440FX chipset Pentium® Pro M/B
- Pentium® Pro 200MHz w/ cooling fan
- 32MB 60ns EDO RAM
- Fujitsu 3.5GB Ultra DMA Hard Disk Drive (10ms)
- 1.44 MB floppy disk drive
- Acer 20X IDE CD-ROM Drive
- Trident 9680 with 1MB SVGA
- 3COM 10/100 base T ethernet card
- ATX mid tower case w/ 235W power supply
- 3-button serial mouse
- 105-key keyboard
- MS NT Sever 4.0 w/ 5 user licenses
- 1-year warranty on parts and 5 years labor

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Windows NT 4.0 Workstation

$1369

AMD K5/CYRIX 6x86

- Intel 430VX Chipset M/B w/512K Cache
- AMD K6 100MHz w/ cooling fan
- 16MB 60ns EDO RAM
- Fujitsu 1.2GB EIDE Hard Disk Drive
- 1.44MB floppy disk drive
- Acer 20X IDE CD-ROM drive
- PCI SVGA card w/ 1MB RAM
- 3D 16-bit sound card
- 33.6 fax modem w/ voice (rockwell chipset)
- Mini tower case w/ 230W power supply
- 3-button serial mouse
- Win95 105-key keyboard
- P60W multimedia speakers
- Windows 95 installed
- 1-year warranty on parts and 5 years labor

$652

AMD K6 P166MHz	$709
Cyrix 6X86 P166+	$685
Cyrix 6X86 P200+	$699

AMD K6 MMX™ SYSTEM

- Asus 430TX chipset M/B with 512K cache
- AMD K6 166MHz MMX™ w/ cooling fan
- 32MB 60ns EDO RAM
- Fujitsu 2.6GB Ultra DMA Hard Disk Drive (10ms)
- 1.44MB floppy disk drive
- Acer 20X IDE CD-ROM Drive
- ATI 3D Xpression+ w/4MB SGRAM
- Sound Blaster "Compatible" 16-bit sound card
- 33.6 fax modem w/ voice (rockwell chipset)
- ATX mid tower case w/ 230W power supply
- 3-button serial mouse
- Win95 105-key keyboard
- P60W multimedia speakers
- Windows 95 installed
- 1-year warranty on parts and 5 years on labor

$999

AMD K6 200MHz MMX™	$1059
AMD K6 233MHz MMX™	$1189

Pentium® II SYSTEM

- Intel 440LX chipset M/B (USB ports)
- Pentium® II 233MHz MMX w/cooling fan
- 32MB 10ns SDRAM
- Fujitsu 3.5GB Ultra DMA Hard Disk Drive (10ms)
- 1.44MB floppy disk drive
- Acer 20X IDE CD-ROM Drive
- Matrox Mystique 3D 220 with 4MB SGRAM
- Sound Blaster "Compatible" 16-bit sound card
- 33.6 fax modem w/ voice (rockwell chipset)
- ATX mid tower case w/ 235W power supply
- Microsoft 3-button serial mouse
- Win95 105-key keyboard
- P240W multimedia speakers
- Windows 95 installed
- Office 97 Professional Suite
- 1-year warranty on parts and 5 years on labor

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Pentium® II 266MHz MMX™	$1739
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- 16MB 60ns EDO RAM
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- Nickel Hydrade battery
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- Software bundle: Encarta 97, MS Money MS Works, MS Entertainment Cost
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Intel Atlanta 440LX for Pentium® II	$195
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Intel 430VX Chipset w/512K Cache	$82
Intel Venus 440FX Chipset for Pentium® Pro	$159
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Intel 430VX Chipset w/512K Cache	$87

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Intel Pentium® 233 MMX	$365
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AMD K6 233	CALL

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Trident 9680 PCI DRAM w/ 2/1 MB DRAM	$35/25
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Diamond Stealth 3000 w/ 2/4 MB DRAM	$98/128
Matrox Millennium II w/2/4 MB WRAM	$159/189
Matrox Mystique 220 w/2/4 MB SGRAM (OEM)	$95/116

FAX MODEM

US Robotics 33.6 K Fax Modem w/ Voice	$99
33.6K Fax Modem w/Voice	$49
55.6K USRobotics Fax Modem Retail	$135

SOUND CARDS

ACER 3D	$19
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Sound Blaster AWE 64	$89

SPEAKERS

60 Watt	$14
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Mini Tower w/ Display	$26
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Desktop Case	$31
Mid Tower ATX w/230W Power Supply	$79

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104–Key Board	$11
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17" .28 NI SVGA	.399
Sony 100SX 15" 1280x1024 .25 w/Digital Controls	.338
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ViewSonic 17PS 17" .25 1600x1280	.638

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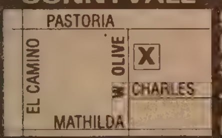

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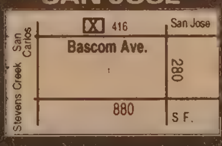

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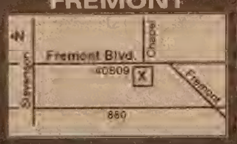

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BY FABIAN PASCAL

32-bit Computing

Not By CPU Alone

(First Of A Series)

The average user faces an increasingly daunting set of circumstances with respect to PC hardware and software choices.

On the one hand, operating systems and applications are demanding more and more resources because they do more, in more complicated ways, handling more and more information. In the advent of the Net, both data and the software processing make heavy use of graphics and multimedia, which places considerable (and growing) demands on hardware.

At the same time, hardware technology is continuously changing in many directions, not always coordinated. Which changes are cost-effective, or even useful for the average user, is far from obvious and, to put it politely, not easy to figure out. This is due, not in small part, to the Wintel monopolistic combination driving PC technology: Attention to user needs is not as great as under competitive conditions, and competition to increase such attention is difficult.

Unable, or unwilling to research the confusing complexity of the intricate and subtle ways in which various system elements and peripherals interact to provide overall performance and functionality for a variety of tasks, non-technical PC users are naturally influenced by marketing. They focus on prominently advertised items such as official CPU speed, the number of peripherals bundled with systems, or price, without realizing the importance of more obscure system elements such as the type and quality of the system board, chipset, memory bus and cache. Poorly matched components can defeat a good choice of others; so can the video and I/O subsystems and their attached peripherals. Benefits, if any, from highly advertised new technological developments such as the Advanced Graphics Port (AGP), UltraDMA, SCSI3 or Fibre Channel can also be defeated this way.

In fact, even those willing to dedicate time and effort to research the issues and spend whatever it takes to get the best-matched, maximum-performance system, will find that they must hurry up and wait for new products, because of the unsynchronized way in which technologies develop and are implemented and marketed.

This series will explain and analyze (in as non-technical language as possible) what needs to be considered to optimize choices for 32-bit computing. Guidelines will be provided for "best-of-breed" systems at current or forthcoming levels of technology, so that users can choose their preferred trade-off points between performance and cost intelligently. The purpose is to help avoid overspending on sub-optimal systems, or crippling your choice by misplaced savings.

> Non-technical PC users are naturally influenced by **marketing.** They focus on prominently advertised items such as official CPU speed, the number of peripherals bundled with systems, or price, without realizing the importance of more obscure system elements.

The Mother Of All Boards

For those who want the maximum 32-bit performance possible, Intel's current top-of-the-line CPU is the Pentium II (PII) at 266MHz clock rate, with 300MHz+ versions forthcoming. Unlike previous Pentium models, the PII has competitors: the AMD K6 and the Cyrix 6x86MX (or M2), both currently at 233MHz, with 300MHz+ versions forthcoming. But those who go by CPU clock rate and price alone should think again.

Regular Pentium processors use system boards of a type called Socket 7; Pentium Pro CPUs use Socket 8 boards. Neither type of board will accept a PII, which requires the new Slot I system board—a proprietary technology which Intel does not license. The less-expensive K6 or M2 CPUs, on the other hand, are targeted at the cheaper Socket 7 boards. Because Intel does not offer an upgrade path for the Pentium Pro, Socket 8 board owners must buy new system boards altogether, be it either Socket 7 or Slot I, if they want to upgrade. Those users lucky enough to have a Socket 7 board with the right features (see next article), can choose between a CPU-only upgrade from a Pentium to a non-Intel CPU and an altogether new PII Slot I system board.

But is the choice really between K6/M2 and PII systems?

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- IDE interface for CD/ROM drive
- Full featured sound capability, including Wavetable
- Plug n' Play Windows '95 compatible
- New in retail box, 90-day HSC warranty

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- 16-bit audio, 44.1KHz digitized stereo sound
- MPU 401 MIDI, Soundblaster compat., SRS 3-D circuitry
- Internal SCSI-2 CD-ROM port, microphone jack (mike not included); line-in & speaker jacks, joystick port
- Includes driver disks, photocopied book
- OEM package (no box), 90-day HSC warranty
- We had these and ran out...New stock at Lower Price!

HSC#17035 **$29.95**

MediaVision ProZonic Sound Card

- IDE interface for CD/ROM drive
- 16-bit audio, 44.1KHz digitized stereo sound
- MPU 401 MIDI, Soundblaster compat., MPC1 & MPC2
- Plug n' Play Windows '95 compatible
- New in OEM package (no box), 90-day HSC warranty
- Includes driver disks, photocopied book

HSC#17028 **$13.95**

Media Vision PCMCIA 16-Bit Sound Card

- Great for Portables, Laptops with PCMCIA Slot
- External Pod has Joystick Port, Mic. input, Line In & Line Out jacks, Volume control.
- Installation software (Windows 3.x), instructions included
- New in OEM packaging (no box), 90-day HSC warranty
- We had these before at $39.95 and they went fast!

HSC#17036 **$29.95**

Hand Scanner Bargain

- Relisys Model HS410G 256 Grayscale Hand Scanner
- Up to 800 dpi (dithered) resolution available
- Brand new OEM pack (styrofoam tray)
- Includes manual, interface card, diskette with TWAIN drivers
- Note: Previous ads in error..no application software is included!
- New, 90 day warranty -- unit is similar to illustration

HSC#17009 **$14.95**

Absolute Last of the Red Hot Reno!

- Now at clearance price -- Media Vision *Reno*:
  - Consists of new external Reno CD/ROM drive,docking bay with SCSI2 port, AC Adapter, cable kit, travel pouch, headphones
  - Late Model version Uses AC adaptor (included) or AA alkaline batteries (not included)
  - Double-speed 180mS drive is lightning fast!
  - Drive detaches from docking bay, use with headphones as a portable personal audio CD player
  - Great for Mac or IBM (adaptor bracket included)
  - Mac software included
  - SCSI Controller & software required for IBM use
  - Brand new, 90-day warran

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Now -

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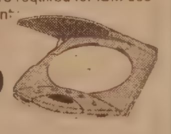

Available Separately:

A. Macintosh Powerbook SCSI Adapter (HDI-30 to 25-pin D connector) **HSC#15704** **$12.50** if purchased alone, or with purchase of Reno Kit,**$5.00**

Drive-bay Speakers!

- Save desk space, eliminate tangled wires!
- Twin-sound by Sound Minds installs in any 5.25" drive bay
- Built-in 4-watt amplifiers punch up sound
- Compatible with any sound card
- Independent volume controls for left & right speaker
- Front-mounted jacks for microphone, headphones

HSC#16277 **$14.95**

Joystick Extravaganza!

- Back in stock -- joysticks for computer games!
- Suncom FX-2000, new in box, unbelievable value!
- Form fitting joysticks work with either hand
- Suction-cup feet anchor them for lightning fast action!
- New in box - 30 day warranty
- Hurry, they went fast last time we had them!

HSC#17008 Suncom FX-2000 Joystick **$4.95**

Low Price, High Quality!

- Superior quality in a PS-2 compatible keyboard!
- Hewlett Packard part #A2840-60207
- 102-key keyboard has standard QWERTY layout with additional French characters
- PS/2 style connector (mini-DIN)
- New in box, 90-day warranty
- Similar to illustration

HSC#17030 **$14.95**

Super Sounding Speakers!

Tired of the cheesy sound coming from those give-away speakers in your multimedia kit? Try upgrading to these sonic wonders...you'll have to hear them to appreciate the difference these will make without blowing your budget!

GNT2002 2-way Bass-Reflex speakers

- 3.25" woofer, 1" piezo tweeter, ported enclosure
- 15W built-in amplifiers, 80W peak, 5.4W RMS
- 40 - 20,000 Hz, built-in SRS 3-D stereo
- Measure approx. 3.75" x 6.125" x 9 25" tall
- AC adaptor, audio cables included
- On-off switch, 3-D switch, bass, treble & volume controls
- Attractive off-white finish with grey grille-cloth

HSC#16884 **$34.95**

GNT3500 3-way Bass-Reflex speakers

- 4" woofer, 2" midrange, 1" piezo tweeter
- 23W built-in amplifiers, 120W peak, 20W RMS
- 20 - 20,000 Hz, built-in SRS 3-D stereo
- Measure approx. 6.25" x 6.5" x 9.75" tall
- AC adaptor, audio cables included
- On-off switch, 3-D switch, bass, treble & volume controls
- Attractive off-white finish with grey grille-cloth

HSC#16671 **$39.95**

Stereo Keyboard!

- Multimedia Stereo Keyboard by SC&T International
- Built-in high power stereo speakers & amplifier
- Full range 4" bass enhanced, hi-fidelity 16 watt speakers
- Works with all sound cards & CD-ROM drives
- Or use with portable radio, cassette or CD player
- Separate Volume, Bass, Treble & Balance slide controls
- Built-in LED volume level bar-graph display
- Built-in omnidirectional microphone, plus mic. jack
- Headphone jack for private listening (headphones incl.)
- New in box, 90-day HSC warranty

HSC#17027 **$37.50**

Phone Voice Scrambler

- Privacy at the push of a button -- SecureTalk by GRE!
- Advanced circuitry encrypts telephone conversations from casual eavesdropping, including scanners!
- Small, portable units operate off AC adapter (Land-line model) or cigarette lighter plug (Cellular model).
- Measures 7" x 4" x 1.5", operates on 9 -12 VDC
- Provides a choice of 32 different scrambling codes over 4 channels. Can be bypassed by pressing "Normal" button.
- Sold in pairs, choose AC operation, mobile, or one of each.
- Unit inserts between handset and base of phone (Note, will not work with slim-line or other all-in-one-piece phones!)
- Unit has DB-9 connectors, you will need to fabricate an adapter cable set (DB-9 male & female to mini-modular connectors, diagram provided, ask about parts kit for land-line unit)
- Both styles are identical except for power adapter and one jumper.
- Units are new in box, 90-day warranty - exchange

HSC# 16909 Land-Line Phone Scrambler

HSC# 16910 Cellular Phone Scrambler

Your Choice - any two, any style for $29.95/pr.

SCSI Device Cases

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- Horizontal style case, 9.5" x 2.5" x 10.5", 30 watt power supply, fan cooled, room for 5.25" drive, front access

HSC#16185 **$29.95**

- Upright Case, 3.5" x 5.5" x 8.125", has front opening for 3.5" drive, 20 watt power supply, no fan

HSC#16559 **$24.95**

- Deluxe quality case, 7" x 4 5" x 10.75", made for Olympus Optical, has 5 25" open front bay, SCSI diagnostic indicator on rear panel, 30 watt fan-cooled power supply, IEC power cord included Assembled in USA.

HSC#16575 **$49.95**

- Small horizontal case, 6.5" x 2" x 8.5", for 3.5" drives, small 17 watt fan-cooled power supply (5V @ 1A, 12V @ 1A)

HSC#16960 **$37.95**

All cases are new, and feature 50-pin Centronics-style daisy-chain connectors, internal 50-pin cable and SCSI ID switch

Bargain Game Controller!

- Quickshot QS-191 Game pad for IBM Compatibles
- Faster action, less fatigue than a joystick
- Why pay more for a game device?
- Brand new, plugs into 15-pin game port

HSC#17033 **$3.95**

Son of SwapBox!

- Just in time...we ran out of the regular SwapBoxes!
- IBM Compatible Reader/Writer for PCMCIA Cards with built-in 1.44 MB Floppy drive...fits in standard floppy bay!
- SwapBox Combo by SCM Microsystems for ISA bus
- Convenient front access for slots (not in rear of system)
- Dual slot, Type I, II or III, hot swappable
- Perfect for transferring data or hardware from laptops, notebooks or other PCMCIA peripherals to desktop PC's
- Directly supported by Windows 95 - no drivers needed!
- Includes DOS driver disk, manuals, cable, internal card
- New in OEM package (white box), 90-day warranty

HSC#16819 **$99.95**

PCI Video Accelerator Cards from Media Vision!

MEDIA VISION PROAxcel

- Blazing fast 64-bit graphic & video card
- PCI Bus card with 1MB RAM, expandable to 2MB
- Uses proprietary chipset (Alliance Semi ProMotion 6410)
- Resolutions up to 800 x 600, 64K colors with 1MB
- Up to 1600 x 1200, 256 colors, 800 x 600, 16M colors (requires 2MB) -- Upgrade chipset available, $7.50
- Supports MPEG, AVI, and other full-motion video formats
- Up to 30 fps full-screen video playback possible (requires 90MHz or better Pentium)
- Win95, NT & 3.1 drivers and full manual on CD-ROM
- If you can not read CD's, diskettes are available, $2 extra
- New in box and have a 90-day HSC Warranty

HSC#16807 **Now--Lower Price!** **$19.95**

Skinny SCSI 2X CD-ROM!

- 1" high SCSI 2x (double speed) CD-ROM drive by Toshiba
- Model Number XM-4101B made for Sun Microsystems
- Mounts in regular 5.25" drive bay (with a gap at top of bezel)
- Lavender colored faceplate -- made for laptop computer?
- Meets MPC-2 level specifications, rugged high quality drive!
- Standard SCSI interface, with drive select jumpers on rear
- New, in plain white box, 90-day warranty

HSC#16870 **$29.95**

Infrared Connections!

- IBM "Options" series ISA-Bus and PCMCIA card adaptors will add industry standard infrared communications capability to your desktop PC (with ISA slots) or notebook computer! (Win95 driver available from Microsoft website)
- Allows wireless connection to compatible notebooks, workstations, printers, and other peripherals supporting the Infrared Data Association (IrDA) standard.
- Also will emulate a COM port for cable-less hook-ups
- Communicates up to 115KBps, or up to 1.152MBps with the included TranXit Software.
- Operates over distances up to 3 meters (10 ft.)
- Includes Card, transceiver module, driver disk & book
- Both styles new in box, 90-day warranty

HSC#16483 PCMCIA Version **$19.95**

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Or a package deal...get both for **$29.95**

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32-bit Computing *continued...*

The easiest way to understand performance is to think of a PC system as a pipe. Several processing elements—CPU, random access memory (RAM), level two (L2) cache, chipset and adapter cards—communicate over two buses: the memory (or system) bus and the PCI bus (SCSI adapters, in turn, communicate with their attached devices over the SCSI bus). Overall performance for any computing task is always at the rate of the narrowest pipe section, be it a processing element, or bus.

The CPU communicates directly with the RAM, L2 cache and chipset over the system bus. The chipset, in turn, communicates with the I/O (IDE or SCSI) and video adapters over the PCI bus. The chipset used by a system board supports specific CPUs and bus speeds, as well as types of RAM and cache.

The maximum system bus speed (or external clock rate) officially allowed and supported by Intel CPUs and chipsets is currently 66MHz. To attain faster speeds, Pentium or compatible CPUs run internally at rates which are multiples of the bus speed, e.g.:

66 x 1.5 => 100
x 2.0 => 133
x 2.5 => 150
x 3.0 => 200
x 3.5 => 233
x 4.0 => 266

with 1.5-4.0 as the multipliers. But the CPU still talks to the L2 cache, memory and chipset at the system bus speed. Intel chipsets also keep the PCI bus speed at half the system bus speed, 33MHz, which is the PCI standard (of which Intel is a co-specifier). So at 66MHz, the bus speed (and Intel chipsets) are the narrowest sections in the pipe, limiting overall performance, regardless of how fast the internal CPU clock or the (increasing) RAM speeds are.

When the system bus speed is increased to 75, 83, or 100MHz (given the official CPU clock rates, this changes the multipliers, e.g. for a P150 the multiplier is 2.5 at 66MHz, but 2.0 at 75MHz), benchmarks show that systems with CPUs with lower internal rates equal the performance of, or even overtake those with CPUs of higher rates. For example, a P166 system at >66MHz bus speed performs as well or better than the same system with a P200 at 66MHz; and a 233MHz K6 system can reach PII levels of performance at higher bus speeds. Most of the performance gain comes from the increased L2 cache speed and the bus operation closer to memory performance rates.

And speaking of memory, systems with the newer, faster Synchronous Dynamic RAM (SDRAM) DIMMs usually do better, everything else being constant, than those with older EDO or BEDO RAM SIMMs. The chipset must support this type of memory (more on SDRAM in future articles).

continued on page 89

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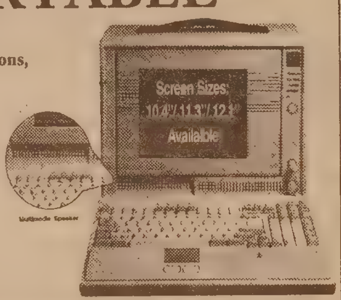

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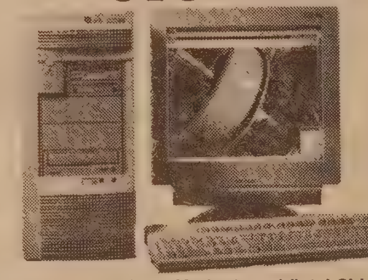

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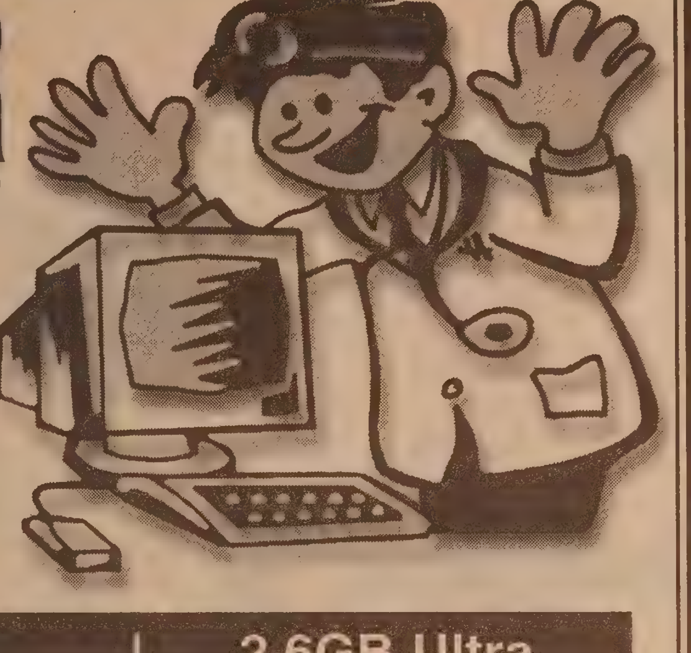

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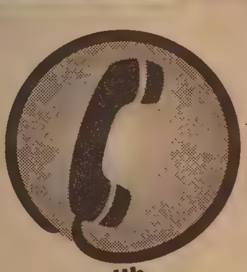

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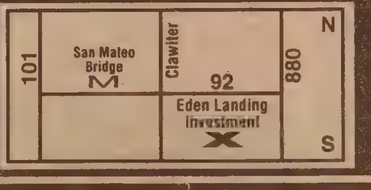

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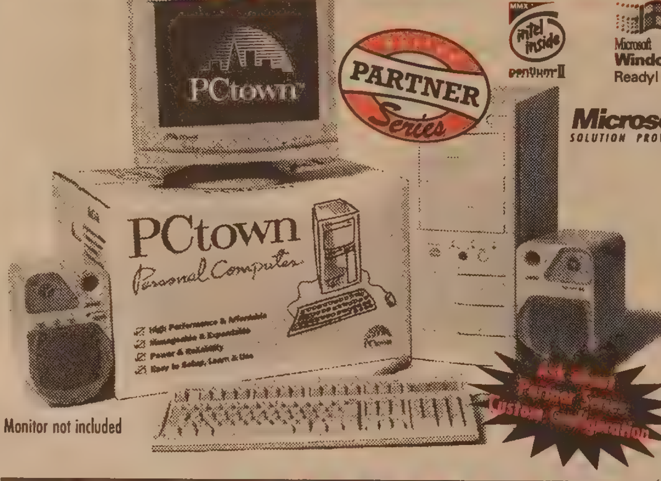

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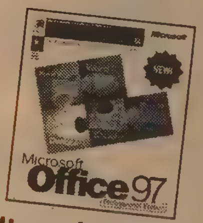

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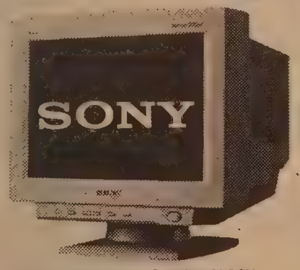

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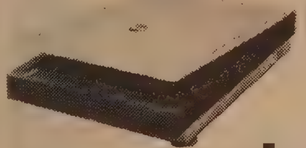

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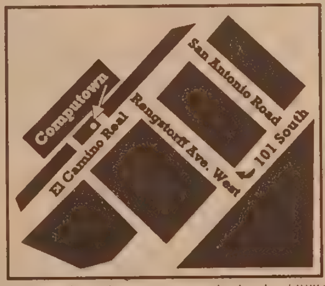

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Expires on November 23, 1997

Computown™

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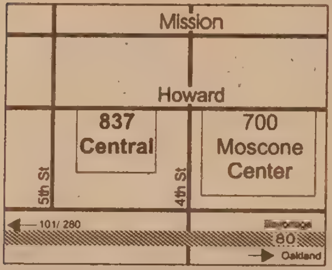

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FAX: (408) 241-0390

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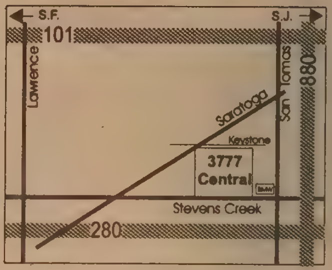
or CentOn@aol.com



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-Intel Pentium® II Processor
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-64MB ECC SDRAM Memory (8x72 10ns)
-2 X IBM DCAS-34330 4.3GB UW SCSI HDD
Only 4.3GB Available After Disk Duplexing
-Sony CDU-511 16X IDE CD-ROM Drive
-Teac 1.44MB FDD
-GT 312 Full-Tower ATX Case
-2 X Adaptec 2940UW SCSI Controllers
-Matrox Mystique 2MB SGRAM PCI
-3COM 3C905TX 10/100 PCI
-Microsoft Windows NT Server 4.0 with 5 Client Licenses
-Windows 95 Keyboard & MS Mouse
-Monitor not included

OPTIONS:
1. HP T-4000 SCSI Tape-Backup Drive 4-8 GB, add $355
2. Upgrade to 128MB ECC Memory (2 of 8X72 60ns) add $325
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266MHz Pentium® II $3559

Central SOHO Series

-32MB EDO RAM, 512k Cache
-ASUS P55T2P4, w/ 430HX Chipset
-Western Digital 3.2GB EIDE HDD
-16X Max CD-ROM Drive
-Teac 1.44MB FDD
-Diamond 3D 2000 4MB PCI
-Sound Blaster 16 PnP
-US Robotics Sportser 56K Int Modem
-SD202 Multimedia Speakers
-Keytronic 104 Keyboard
-Microsoft Serial Mouse w/ Pad
-Microsoft Windows 95 CD
-#3 IWG500 AT Mid-Tower Case
-Monitor not included

AMD K6-166 w/ MMX™ $1219

AMD K6 MMX™ ENHANCED PROCESSOR

200MHz Pentium® w/ MMX™ $1359

MMX intel inside pentium®

Central Home Series

-Intel Pentium® MMX Processor
-16MB EDO RAM, 512k Pipeline
-Fujitsu 1.7GB EIDE HDD
-16X max CD-ROM Drive
-Teac 1.44MB FDD
-Diamond 2500 2MB PCI
-J-Bond Yamaha OPL-3 Sound
-33.6 Internal Fax/Modem
-SP2 Multimeida Speakers
-Mitsumi ZW Keyboard
-Microsoft Serial Mouse w/ Pad
-Microsoft Windows 95 CD
-#3 IWG500 Mid-Tower Case
-Monitor not included

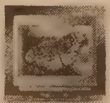
MMX intel inside pentium®
Designed for Microsoft Windows 95

166MHz Pentium® MMX $849

200MHz Pentium® MMX $959

MONITOR

HITACHI *SuperScan* Monitors

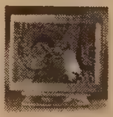


CM500U
15" (13.7" Viewable Size)
Max Resolution 1280x1024 @ 65Hz
Flat Screen, Non-Interlace, MPRII

$280*

CM620U
17" (15.9" Viewable Size) .28
Max Resolution 1280x1024 @ 60Hz
Flat Screen, Non-Interlace, MPRII

$530*



CM751
19" Monitor .26
Max Resolution 1600x1280 @ 75Hz
Flat Screen, Non-Interlace, MPRII

$999*

*Advertised price reflect special discount given with the purchase of any Central systems. Previous purchase excluded.

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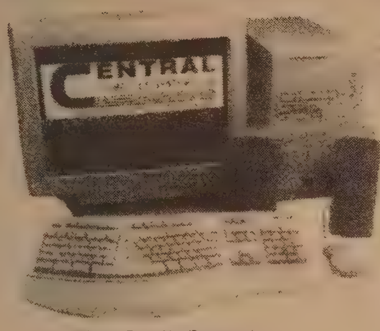
Central Power Series II



Picture Does Not Represent
Exact System Configuration

- **Intel Pentium® II** Processor
  with MMX Technology
- **64MB EDO RAM**
- **Intel Portland** ATX w/ Two **USB**
- **Western Digital 4.3GB** EIDE HDD
- 16X max CD-ROM Drive, Teac 1.44MB FDD
- **Number 9 Revolution 3D 128 4MB PCI**
- **Sound Blaster AWE64** Value
- 33.6 Internal Fax/Modem
- **Microsoft Windows 95** CD
- **Yamaha M7** Multimedia Speakers
- Keytronic PS/2 Keyboard / MS PS/2 Mouse
- ATX #A2 Mid-Tower Case w/ 235W Power Supply
- **Monitor not included**

intel inside pentium II

Designed for Microsoft Windows 95

Pentium® II 300 MHz $2345

266MHz Pentium® II
$2095

Central Value Series

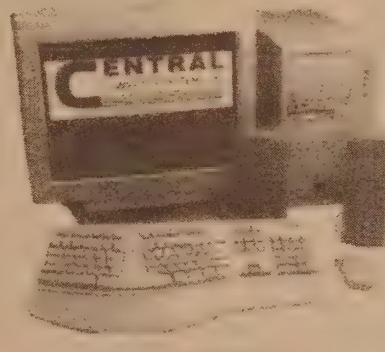
- AMD / Cyrix Processor
- **16MB EDO RAM, 512k Pipeline**
- J-Bond 500c-H4 Motherboard
- **Fujitsu 1.7GB EIDE HDD**
- 16X max CD-ROM Drive
- Teac 1.44MB FDD
- Diamond 2500 2MB PCI
- J-Bond Yamaha OPL-3 Sound
- Mitsumi ZW Keyboard
- Microsoft Serial Mouse w/ Pad
- Mini Multimedia Speakers 4W
- **Microsoft Windows 95 CD**
- Mini Tower Case w/ 230W
- **Monitor not included**

Designed for Microsoft Windows 95

133MHz AMD K5 **$679**	166MHz Cyrix 6x86L+ **$699**
166MHz AMD K5 **$699**	200MHz Cyrix 6x86L+ **$709**

Central Business Series

- **AMD K6 Processor w/ MMX™ Technology**
- **32MB SDRAM** 10ns, **512k Pipeline** Burst SRAM
- FIC PT-2011 ATX, 430TX chipset, w/ USB
- **Western Digital 4.3GB** EIDE HDD
- **24X max CD-ROM Drive**, Teac 1.44MB FDD
- **Matrox Millennium II 4MB** or
  ATI XPERT@Work 4MB
- J-Bond 16bit, Yamaha OPL-3 sound
- 33.6 Internal Fax/ Modem
- ATX #A2 Mid-Tower Case w/ 230W
- Keytronic PS/2 104 Keyboard
- **Microsoft PS/2 Mouse** w/ Pad
- **Microsoft Windows 95 CD**
- SD202 Multimedia Speakers
- **Monitor not included**



Picture Does Not Represent
Exact System Configuration

AMD K6-233 w/ MMX™ $1479
AMD K6-200 w/ MMX™ $1299

AMD K6 MMX™ ENHANCED PROCESSOR

Central Graphic Series II

- **32MB SDRAM** 10ns, 512k Pipeline
- **Intel Anchorage ATX** Motherboard w/ **USB**
- **Quantum 6.4 GB** IDE HDD
- 16X max CD-ROM, Teac 1.44MB FDD
- **Matrox Millennium II 4MB or**
  XPERT@Work 4MB
- Vibra 16 / **Yamaha M7** Multimedia Speakers
- 33.6 Internal Fax/Modem
- Keytronic 104 Keyboard / **Microsoft IntelliMouse**
- **Microsoft Windows 95** CD
- **#A2 ATX Mid-Tower Case w/ 235W**
- **Monitor not included**

Designed for Microsoft Windows 95

intel inside pentium

200MHz Pentium® MMX **$1509**	233MHz Pentium® MMX **$1659**

Bundles

- Microsoft Bundle #1 (Home) . . add $39
  (Encarta '97, Works 4.0, Money)
- Microsoft Bundle #2 (Sports) . . add $24
  (Flight Simulation 5.1, Complete Basball, Golf 3.0)
- Microsoft Bundle #3 (Kids) . . . Add $34
  (Creative Writer, Explorapedia, Magic School Bus)
- Microsoft Office 97 Small Business Edition
  (with complete manuals and CD)
  and Microsoft Works / Money . Add $249

Academic Office Suite:
(Current Student ID Required)

- Microsoft Office 97 Standard . . . add $145
- Microsoft Office 97 Pro . . . . Add $189

Note: Add $20 for pre-load / installation

Tech. Services

- System Diagnosing
- Onsite Repairs
- Printer / Monitor Repairs

Installation:

Primary (1st) HDD	$20
Secondary (2nd) HDD	$30
Memory	$15
Modem	$30
CD-ROM Drive	$20
Tape BackUp Drive	$20
Other Hardware	$30/hr
Software	$30/hr

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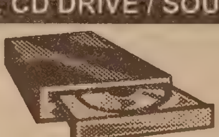
Page 3 / 9

HARDWARE

1. CD DRIVE / SOUNDS



ADDONICS (portable)

10X Pocket Parallel Port	275
12X Parallel Port w. Sound Card	335
20X Max Pocket PCMCIA	315
24X External	279

CREATIVE LABS

Midi Kit + Software	65
Sound Blaster 16 PnP w/o IDE	55
Sound Blaster 64 AWE Gold	**(168) 179*
Sound Blaster 64 Value Pak	**(85) 95*

DIAMOND

DVD Drive w. Kit	379

MITSUMI

FX820S 8X IDE Int	69
FX140S2 16X IDE Int	85
FX240S 24X IDE Int	95

NEC

CDR-1610 16X SCSI Int oem	109
CDR-1800 24X IDE Int oem	89
MultiSpin 6X Int 4CD Rom Changer oem	**(85)*

PIONEER

DR511 24X IDE Int	89
DVD101 IDE Int	189
DVD301 SCSI Int	289

PLEXTOR

PX-12CSi 12X SCSI Int (Caddy)	259
PX-20X SCSI Int (Tray)	219

SONY

CDU-511 16X IDE Int	89
CDU-611 24X IDE Int	95
PRD-650 Portable 6X w. PCMCIA Kit	315

TEAC

CD-524E 24X IDE Int	95
CD-516S 16X SCSI Int	119

TOSHIBA

5701 12X SCSI Int	115
DVD Drive IDE w. Kit	399
XM-6102B 24X IDE Int	95

TURTLE BEACH

Multi-Sound Fiji 20-bit / w. Digital I/O	275/329
Multi-Sound Pinacle 20-bit / w. Digital I/O	375/425
Tropez Sound 32 Voice	145
Wave Table Sound 32	99

OTHERS

CD Caddy	3.99
CD Jewel Case for 1 / 2 / 3-CD	0.55/0.65/0.55
CD Wetsuit (by Kensington) for 12 / 24-CD	9.95/13.95
Decoder Card	129
ESS 16 IDE Sound Card	29
Gravis Ultrasound Plug & Play	135
Gravis Ultrasound Pro, PNP	175
J-Bond MF-719 Yamaha 3D 32	29
Television: TeleSound EX16 IDE	**(68)*

WRITABLE CD DRIVES :

Adaptec Easy CD Creator Deluxe (software)	89
Elektroson: Gear (CD creator software)	95
HP SureStore C7110i 6X/2X Parallel Int	399
HP SureStore C7110e 6X/2X Parallel Ext	499
Philips Omniwriter (Ricoh) CDR-6200S 6X/2X Int oem / reg	459/499
Ricoh 6X/2X Int ($100 Rebate)	545
Yamaha CDR-400 6X/4X Int / Ext	479/569

3M /Sony CDR (74 min.) / 10-pk.	*(5.95)/58
Kodak CDR 74 min. / 10-pk / 25-pk	4.50/43/100
Pioneer /Traxdata CDR 74 min. / 10-pk	4.50/43
Ricoh CDRW 74 min.	22
TDK CDR 74 min. / 10-pk	4.95/47

SPEAKERS :

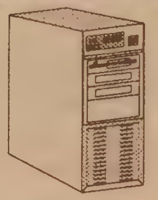
Active 85 Hi-Fi Amplier (100W)	39
Active SP-690 Amplied	33
Altec ACS45 w. Sub-woofer	79
Altec ACS51 / ACS52 / ACS53	65/85/125
Altec ACS150	99
Altec ACS500	295
Labtec Stereo LCS-150	18.95
Labtec Stereo LCS-600	24.95
Labtec 1002 (10W)	49
Labtec 1224 Space Server 3D Stereo (10W)	69
MLF-CP55 Mini Speakers (4W)	**(4.99)*
Yamaha YST-M7 (5W)	**(39) 45*
YST-M15 (10W)	**(59) 69*
Yamaha System 45W (M15 + MSW-10 SubWoofer)	169

SPECIALS

HM2: Headset w. volume control	**(9.95) 11.95*
KC3: Headphone + Microphone	**(6.95) 8.95*
MC1: Pocket Size Microphone	**(5.95) 7.95*
MC2: Condensed Microphone	9.95
SD202: Full Range Speakers, 120W	24.95
SD322: Sub-Woofer	**(39.95)*
SD688: Deluxe 3D Surround, 360W	**(49.95)*
SD880: Amplified Stereo Speakers, 200W	**(29.95)*
SD980: 3-Way Speakers, 180W	**(39.95)*
SP2: Supreme Sound Speakers w. KC1	19.99

Reseller CALL for wholesale prices!

2. CASES



#1: Baby AT w. 230W Power	39
#2: Baby Tower w. 230W Power	29
#3: IWG500 Mid Tower w. 230W	59
#4: Mid Tower w. 250W Power	39
#5: CF-8502A Mid Tower w. 250W, Open Side	69
#6: GT212 Mid Tower, 250W, Open Side, 2 fans, White	105
#7: GT210 Mid Tower, 250W, Open Side, 2 fans, Black	109
#8: Full Tower w. 250W, 2 fans	85
#9: CF-8501S Full Tower w. 250W, Open Side	89
#10: KS-A5561 Full Tower, 250W, Slide Open, 2 fans	115
#11: Full Tower, 300W, with Wheels	149
#12: GT312 Full Tower, 300W, Open Side, 2 fans, 8 Bay Slots, PS/2 power, White	149
#13: GT300 Full Tower, 300W, Open Side, 2 fans, Black	155
#14: Mini Tower w. 250W Power	47
#15: Mid Tower w. IDE Mobile Rack	65
#16: 701D Mini Tower w/ 230 Watt	39
#17: 668A Full Tower w. 250W	69
#18: 668B Mid Tower w. 250W	55
#19: 668C Mini Tower w. 230W	39
#20: Mini Tower w. 230W	497
#A1: ATX CF-8502A Mid Tower, 235W, Open Side	79
#A2: ATX mini-mid Tower w. 230W	79
#A4: ATX-T5 Mid Tower w. 235W, Slide Open	79
#A5: ATX CF-8501S Full Tower, 235W, Open Side	99
#A6: ATX GT-232XC Mid Tower w. 235W	119
#A7: ATX GT-312 Full Tower w. 235W	145
#A8: ATX PC-268A Desktop w. 235W	75
#A9: ATX PC-968A Mid Tower w. 235W	79
#A10 ATX PC-768A Full Tower w. 250W	99
#A12: ATX 668B Mid Tower w. 230W	79
#A13: ATX 668A Full Tower w. 250W	95

HDD EXTERNAL CASING:

3.5" HD External Casing	49
5.25" or CD Rom External Casing	51
1 half ht, 3.5" parallel	65
1 half ht, 50W, SCSI-2 / Wide-SCSI	65/69
2 half ht or 1 full ht for PC, 80W, w. SCSI cable	75
2 half ht or 1 full ht for PC, 80W, SCSI-2 / SCSI-3	99/105
4 half ht or 2 full ht, 200W, w. cable	99
4 half ht or 2 full ht, 200W, SCSI-3 w. cable	129
8 half ht or 4 full ht, 250W, / SCSI-3	195/255
CDR Box, IDE Parallel	59
PD-250 Para Disk, 2.5", IDE Kit, carrying bag	57

ANTEC

KS-011+RPP3002: 19 Bay Server (9 front,10 int. bay) 300W,Hot-Swap + Redundant P/S, 2 Cooling Fan	569
KS-011+RPT600: 19 Bay File Server (9 front,10 int. bay) 300W Redundant Vertical AT P/S, 2 Cooling Fan	459

SUPERMICRO

750A: ATX, Full Tower w. 300W	205
750S: Full Tower w. 300W	195
750S: Full Tower w. 400W	235

3. CONTROLLERS

adaptec

2940 SCSI PCI w. Kit oem	189
2940U SCSI PCI w. Kit oem / reg	205/249
2940UW Ultra Wide-SCSI PCI w. Kit oem/reg	245/289
AAA-131 Raid Wingle Ahannel	445
AAA-133 Raid 3 Channel	689
AHA3940U PCI Multi-Channel SCSI	399
AHA3940UW Ultra-Wide w. Kit	479
APA1460 Slim PCMCIA SCSI	**(159)*
ASW-EZ SCSI 3.1 for Dos & Windows	59
ASW-EZ SCSI 4.0 for Win'95	69

ADVANSYS

ABP5140 SCSI-2 ISA 8Mb/s	115
ABP930 Ultra SCSI PCI 20Mb/s	135

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NEW! Introductory Offer...

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SPECIAL! INI-9100 PCI-SCSI Bus Master Host Adapter **$69.** (reg. $119)

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ASUS

AS300UW SCSI & 16-bit audio adapter	215
SC200 SCSI-2 PCI (w. NCR chips)	79

COREL

Corel SCSI Software v2.5	85

DIAMOND

FirePort 40 UltraSCSI PCI	159

KOUWELL

KW557A IDE/ 1.44/ 2S (FIFD)/ ECP/ 1G	25

LDP (Lomas Data)

Fast PCI SCSI-2 10Mb/s	**(99)*
Fast PCI 20, Ultra Wide SCSI, 40Mb/s	**(195)*

NEW MEDIA

Basic SCSI DB25 PCMCIA	99
Bustoaster SCSI-2 PCMCIA	165

SIIG (5 yr. warranty)

CN2419 EIDE 4HD/ 2FD 16 bit ISA	59
CN2420 EIDE 4HD 16 bit ISA	39
CN2424 EIDE 4HD/ 2FD/ 2S 1P 1G/ 16550 & IEEE1284	79

OTHERS

NEC 2930 SCSI	169
PROMISE EIDE 2300 Plus IDE/ 4HD/ 2S 1P/ 16550	59
WESTERN DiGiTAL Fast SCSI-2 PCI, 10Mb/s	79

4. CPU

AMD

AMD-K5-133	85
AMD-K5-166	105
AMD-K6-166	139
AMD-K6-200	199
AMD-K6-233	379

CYRIX (w. fan)

6x86L-P166+ (2.8V), boxed version	89
6x86L-P200+ (2.8V), boxed version	99
6x86MX-166 / boxed version	119/139
6x86MX-200 / boxed version	169/189

intel.

486 DX4-100	49
MMX-166Mhz Pentium®	159
MMX-200Mhz Pentium®	269
MMX-233Mhz Pentium®	369
MMX-166Mhz Pentium® (3 yr. warranty)	175
MMX-200Mhz Pentium® (3 yr. warranty)	295
MMX-233Mhz Pentium® (3 yr. warranty)	429
P54C-133Mhz Pentium®	109
P54C-150Mhz Pentium®	109
P54C-166Mhz Pentium®	149
P54C-200Mhz Pentium®	189
133Mhz Pentium® w. fan (3 yr. warranty)	117
150Mhz Pentium® w. fan (3 yr. warranty)	119
Pentium® II 233Mhz w. fan	589
Pentium® II 266Mhz w. fan	749
Pentium® II 233Mhz (3 yr warranty)	595
Pentium® II 266Mhz (3 yr warranty)	755
Pentium® II 300Mhz (3 yr warranty)	995
Pentium® Pro 180Mhz w. fan & 256k	229
Pentium® Pro 200Mhz w. fan & 256k	519
Pentium® Pro 180Mhz w. fan (3 yr. warranty)	439
Pentium® Pro 200Mhz w. fan, 256k, 3 yr warranty	**(535)*

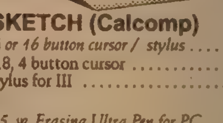
OverDrive®:

Pentium® 83Mhz (fr 486-33 or DX2-66)	199
Pentium® 133Mhz (fr P-60 / 66)	199
Pentium® 150MMX (fr P-75 / 90)	335
Pentium® 166MMX (fr P-100)	365

OTHERS

Cooling Fan for 486 CPU	4.95
Cooling Fan for Pentium® processor	6.95

5. DIGITIZERS



SUMMASKETCH (Calcomp)

III 12 x 12, 4 or 16 button cursor / stylus	**(249)*
III Pro 12 x 18, 4 button cursor	465
- 2 button stylus for III	39

WACOM

Art Pad II 4x5, w. Erasing Ultra Pen for PC	**(129)*
Art Pad II 4x5, for MAC	139
Art Z II 6x8, w. Erasing Ultra Pen for PC	**(299)*
- for MAC	309
Art Z II 6x8, w. Fractal Expression	**(359)*
Art Z II 12x12, w. Erasing Ultra Pen for PC	415
ArtZ II 12x12 for MAC	429

**(sale price) ..... SPECIALS , limited to stock on hand*
Prices subject to change without notice.

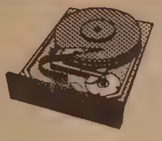
http://www.centralcomputer.com for current prices & catalog

Art Z II 12x12, w. Fractal Expression	479
Art Z II 12x18, w. Erasing Ultra Pen for PC	685
UC-520 4-button Puck	45
UP-201 Pressure Stylus	49.95
UP-701E Erasing Ultra Pen	64.95
UP-801E Erasing Ultra Pen	69.95

No store can claim to have the widest selection and lowest prices, but we come closest.

Over the past 11 years, we have been committed to serving our customers in the way we would want to be served. We believe that a *Wide Selection, Low Prices* and *Good Service* are customers' vital needs. Therefore, we try our best to satisfy these needs.

6. DRIVES



One Year Warranty on All Disk Drives

FLOPPY DRIVE :

O.R. Technology

120MB 3.5" oem / reg	149

TEAC

1.44MB 3.5" / w. frame	27/31

HARD DRIVE :

FUJITSU

M1636TAU 1.2GB 10ms 128k, 5400rpm, IDE	135
M3017AT 1.7GB 10ms 128k, IDE DMA	149
M3026AT 2.6GB 10ms 128k IDE DMA	179
M3035AT 3.5GB 10ms 128k IDE DMA	219
M3052AT 5.2GB 10ms 128k IDE DMA	325
M2954QYS 4GB 8ms 512k Ultra-Wide-SCSI	629
M2954SYU 4GB 8ms 512k SCSI-2, 7200rpm	529
M2949QYS 9GB 10ms 512k Ultra-Wide-SCSI	1095
M2949SYU 9GB 10ms 512k SCSI	**(1045)*

IBM

DCAS-32160 2GB 8.5ms Ultra-Wide SCSI, 5400rpm	259
DCAS-34330 4.3GB 8.5ms Ultra-Wide SCSI, 5400rpm	369

KINGSTON

PCMCIA 260MB IDE, type III	375
PCMCIA 340MB IDE, type III	445

Quantum

SALE (limit 1 per customer, while supplies last)

QM32160STS 2GB 10ms128k SCSI-2	**219**

ST32160A 2GB 10ms 128k IDE DMA	189
QM33240ST-A 3.2GB 10ms 128k IDE DMA	229
QM34320ST-A 4GB 10ms 128k IDE DMA	269
QM36480ST-A 6.4GB 10ms 128k IDE, 5400rpm	369
Atlas-2 2275S 2.1GB Ultra-Wide SCSI	359
QM33240ST-S 3.2GB 10ms 128k Ultra-SCSI	315
QM34320ST-S 4.3GB 10ms 128k Ultra-SCSI	329
Atlas-2 4550S 4.5GB 8ms 512k Ultra SCSI	619
Atlas-2 4550W 4.5GB 8ms 512k Ultra-Wide-SCSI	629
Viking 4550W 4.5GB Ultra-Wide-SCSI	619
QM36480ST-S 6.4GB 10ms 128k Ultra-SCSI	489

Seagate

ST-31277A 1.2GB 12ms 64k, IDE, 4500rpm	135
ST-32122A 2.1GB IDE DMA	179

*** 5 Year Warranty for below drives ***

ST-32272N 2.2GB 9ms Ultra SCSI	409
ST-32272W 2.2GB 9ms Ultra-Wide-SCSI	439
ST-34501W 4.5GB UW-SCSI, 10,000rpm	719
ST-34572N 4.5GB 9ms Ultra SCSI	625
ST-34572W 4.5GB 9ms Ultra-Wide-SCSI	645
ST-19101N 9GB Ultra-SCSI, 10,000rpm	1195
ST-19101W 9GB Ultra-Wide-SCSI, 10,000rpm	1245
ST-19171N 9GB Ultra SCSI	975
ST-19171W 9GB Ultra-Wide SCSI	979

TOSHIBA (notebook drive)

PCMCIA 262MB IDE	425
MK1401MAV 1.4GB IDE 2.5"	195
MK2103MAV 2GB 13ms 128k IDE 2.5"	259

WESTERN DIGITAL

SALE (limit 1 per customer, while supplies last)

WD-33200 3.2GB 12ms 128k IDE	**219**

WD-21600 1.6GB 10ms 128k IDE	165
WD-22100 2.1GB 12ms 128k IDE	189
WDC-AC34300 4.3GB IDE DMA	259
WDC-AC35100 5.1GB IDE DMA	329
WDC-AC36400 6.4GB IDE DMA	369
WDC-E2170 2.17GB Ultra SCSI	399
WDC-E2170 2.17GB Ultra-Wide-SCSI	429
WDC-E4360 4.3GB Ultra SCSI	619
WDC-E4360 4.3GB Ultra-Wide-SCSI	625

OTHERS

Descartes PCMCIA Card Reader /Writer for PC	99
Mounting Frame for 3.5" Hard / Floppy Drive	4/4
Removable Case for 3.5" HD IDE	17
Removable Case for 3.5" HD IDE Metal	26
Removable Case for HDD SCSI / Wide-SCSI	17.50/59

REMOVABLE DRIVE :

IOMEGA

Jaz Drive 1GB SCSI Int / Ext	275/369
Jaz Disk 1GB / 3 pack / 5 Pack	84/250/399
Jaz Traveller	45
Zip Drive 100MB IDE oem	109
Zip Drive 100MB SCSI Int / Ext	145/145
Zip Drive 100MB Parallel	**(135)*
Zip Disk 100MB : Single / 3-Pack	12.50/36
Zip Disk 100MB : 6-Pack / 10-Pack	70/115
Zip Zoom SCSI Accelerator Card (for Ext.)	46

SYQUEST

SyJet 1.5GB IDE Int	289
SyJet 1.5GB Parallel	379
SyJet 1.5GB SCSI Int / Ext	289/379
1.5GB Cartridge	99

7. I/O CARDS

KOUWELL

KW508-E Single Parallel Port	12
KW524J-1 2S /2P w. 16550 chips	27

QUICKPATH

FlexPort 42: 4 Serial / 2 Parallel (Bi - Dir), 16550	99
FlexPort 22EX: 2 Serial / 2 Parallel / 16650	99
PortFolio 550E: 13 Port Multi-I/O, 4 Serial/ 4 FDD/ 2 Parallel/ 2 IDE/ 1G	125

SIIG

Cyberpro 2S Highspeed w. 16650 chips	55
Cyberpro 4S Highspeed w. 16650 chips	89
IO1809 2S/1P w. 16550 chips	39
IIEEE 1284 EPP/ ECP/ Parallel Port	32

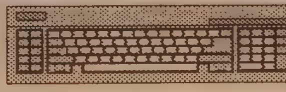
SOCKET COMMUNICATIONS

PCMCIA Serial I/O 16550	149
PCMCIA Dual Serial I/O	215

STB 4-COM

4 Serial, 16 bit, 16550, support Com 1-8, IRQ	99

8. KEYBOARDS



FOCUS

FK2001 104 for Win'95	26
FK7200 101 Trackball	27
FK8200 124 Key w. calculator	42
FX9200W 124 Key w. Trackball & calculator	45

KEYTRONIC

104 Key: White / Black	*(24)/39
104 Key PS/2	26
104 Key PS/2&AT Combo	28
LT Touch Pad	85
Wireless IR Classic 104	58
Wireless IR Touchpad / Trackball	75/74

MICROSOFT

Natural Keyboard oem	55

QTRONIX

Scorpius 104+ for Win'95: White / Black	23/24
Scorpius 105 / w. Trackball	32/49

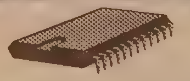
SIIG

Minitouch 81-key Click	45
Supertouch 101 Click	53
W104 (for Win'95) / Wintouch 104	29/39

OTHERS

Antec 104: White / Black	18/39
BTC 5100 Key Mini (80-key)	29
EZ Key Natural Keyboard	28.50
Maxi 101	29
Mitsumi 104 Model-ZW	**(14.95)*

9. MEMORY



DIMM

4 x 72 - 60ns, 168-pin (32MB)	199
8 x 72 - 60ns, 168-pin (64MB)	389
16 x 72 - 60ns, 168-pin (128MB)	639
Unbuffer SDRAM 2 x 64 - 10ns	79
Unbuffer SDRAM 4 x 64 - 10ns	129
Unbuffer SDRAM 8 x 64 - 10ns	319

SIMM

4 x 9 - 60ns	(4MB)	25
1 x 36 - 60ns	(4MB, 72-pin)	35
2 x 36 - 60ns	(8MB, 72-pin)	59
4 x 36 - 60ns	(16MB, 72-pin)	79
8 x 36 - 60ns	(32MB, 72-pin)	149
16 x 36 - 60ns	(64MB, 72-pin)	289
EDO 1 x 32 - 60ns	(4MB)	18
EDO 2 x 32 - 60ns	(8MB)	29
EDO 4 x 32 - 60ns	(16MB)	49
EDO 8 x 32 - 60ns	(32MB)	99
Non Parity : 1 x 32 - 60ns		18
Non Parity : 2 x 32 - 60ns		29
Non Parity : 4 x 32 - 60ns		49
Non Parity : 8 x 32 - 60ns		99
Non Parity : 16 x 32 - 60ns		259

NOTEBOOK MEMORY (3rd party)

for AcerNote 374, Nuovo 971/ 972 - 8MB / 16MB / 32MB	95/145/499
for AST Ascentia 950N - 8MB / 16MB	115/165
for AST Ascentia J30 / J50 - 8MB / 16MB / 32MB	85/139/258
for AST Ascentia P30/ P50 - 8MB / 16MB	115/175
for Compaq Armada 4120 / 4130 - 8MB / 16MB / 32MB	95/155/269
for Compaq Contura 410 / 420 / 430 - 4MB / 8MB / 16MB	75/99/155
for DEC HiNote 433 / 450 / 475 - 4MB / 8MB / 16MB	59/89/145
for HP Omnibook 5000 / 5500 - 8MB / 16MB / 32MB	109/165/285
for IBM Thinkpad 365X / 560 / 760EX/ ED/ EL - 8MB / 16MB / 32MB	89/155/235
for NEC Versa 6030X / H - 8MB / 16MB / 32MB	105/165/295
for Panasonic CF-62EX / 25EX - 8MB / 16MB / 32MB	95/145/499
for Toshiba T1900 / T4500 / T200CS - 4MB / 8MB / 16MB	89/109/165
for Toshiba T2100 Series -4MB/8MB/16MB/24MB	65/89/135/195
for Toshiba Portege 610CT - 8MB / 16MB / 32MB	89/130/249
for Toshiba Portege 650/ 660CDT - 8MB/ 16MB / 32MB	75/120/230
for Toshiba Tecra 700 - 32MB	**(235)*
for Toshiba Tecra 710/ 720/ 730CDT - 8MB / 16MB / 32MB	89/130/249
for Toshiba Satellite 430CDS/CDT / 100 / 200CDS/CDT - 8MB / 16MB / 32MB	89/130/249

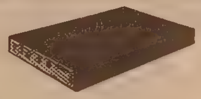
PCMCIA Flash RAM Card

4MB / 8MB /10MB /16MB / 20MB	125/165/179/225/259

OTHERS

Memory for Laser Printer upgrades	Call

10. MODEMS & FAX



APOLLO

PCMCIA 33.6 w. AT&T chipset	105

BOCA

SALE (5-in-1 multimedia)

SE14SRS 14.4 Sound Expression Int	***(59)**
SE34SRS 28.8 Sound Expression Int	***(99)**

DIAMOND

Supra Express 33.6 Fax PNP Int oem	65
Supra Express 33.6 Fax PNP Int / Ext	79/95
Supra Express 56k Fax PNP Int / Ext	139/155
SupraNet Commander ISDN	**(209)*

HAYES (Prac. Peripherals)

Accura 33.6 Fax Int / Ext	**(125/159)*
Optima 33.6 v.34 Fax Int	239
Optima 288 v.34 PCMCIA w. EZ jack	**(145)*
PC288HC 28.8 v.34 Fax, 230K DTE Int	**(195)*
PC288MT 28.8 v.34 Fax Ext.	**(149)*
PM288HC 28.8 v.34 Int	**(69)*
PM336HC 33.6 Int	95
PM336MT 33.6 Ext	115

JATON

Explorer 56k X2 Technology w. Voice Int.	99

MEGAHERTZ

XJ1336 PCMCIA 33.6 Flash upgradable	**(199)*
XJ1560 PCMCIA 56k	**(215)* 224
XJ4288M PCMCIA Fax, cellular w. Motorola cable	249
XJ4336 Cellular Capable 33.6	225
XJ5560 Cellular Capable 56k PCMCIA	**(249)*

MICROCOM

Deskporte 28.8S V.34 Fax Ext	**(95)*
Deskporte 28.8P V.34 Ext Parallel	**(125)*
Officeporte 33.6 Voice ASVD Ext	155

MOTOROLA

SALE

BitSerfer ISA ISDN (#1750)	***(245)**
BitSerfer Pro ISA ISDN Int (#1994)	***(298)**
BitSerfer Pro ISDN Easy Ext	***(275)**
BitSerfer Pro ISDN Multilink PPP Ext	***(299)**
Mobile Serfer 56k PCMCIA	**169**
Modem Serfer 33.6 Int / Ext	***(75/95)**
Modem Serfer 56k Int / Ext	***(94/109)**
Montana PCMCIA 33.6	**165**
Montana PCMCIA 33.6 w. cellular cable	**185**
NT1D Network Terminator	**165**
Online Serfer 28.8 Fax Int / Ext	***(65/69)**
Premier 33.6 Modem Int / Ext	***(149/169)**
Voice Serfer 33.6 Int / Ext	***(99/115)**

SIMPLE TECHNOLOGY

Communicator 56k PCMCIA Voice & Cellular Cap	199

USRobotics

SALE

Courier I-Modem #U with Analog Int / Ext	239/285
Courier I-Modem #2 v.34 w. NT1 Int / Ext	259/335
Courier V. Everything 56k Int / Ext (free CU-See Me software, while supplies last)	**(205/235)*
Sportster ISDN 128k Int	215
Sportster 28.8 Win Modem Int	85
Sportster v.34 33.6 Fax Int oem / reg.	**(89/105)*

**(sale price) ..... SPECIALS, limited to stock on hand*
Prices subject to change without notice.

http://www.centralcomputer.com for current prices & catalog

Sportster v.34 33.6 Fax Ext	**(139)*
Sportster v.34 33.6 Fax/ Voice / Speaker Phone Int oem	105
Sportster v.34 33.6 Fax/ Voice / Speaker Phone Int reg	139
Sportster v.34 33.6 Fax/ Voice Mail/ Speaker Phone Ext	159
Sportster 56K Int / Ext	165/185
Sportster 56k w. Voice Int / Ext	189/205
Total Control Modem: Pool/8	2150
Total Control Modem: Pool/16	4250

WISECOM

SALE

(5 yr warranty)

3314-JS3 33.6 Data Fax/Voice Int (Rockwell)	**54**
3314-JS7 33.6 Data Fax/Voice Int (Davicom)	**49**
5614-JS3 56k Data Fax/Voice Int (Rockwell)	**94**
5614-WD8 X2 56k Data Fax/Voice Int (TI)	**89**

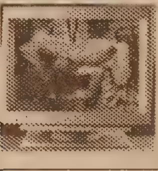
XIRCOM

CM-28 28.8 Fax PCMCIA	**(149)*
CM-33 33.6 Fax PCMCIA	169
CM-56G 56k PCMCIA Global Access	**(199)*

ZOOM (7 yr warranty)

#2805 33.6 Fax Modem Int	**(95)*
#2836 33.5 Fax Modem Ext	**(105)*

11. MONITORS



Monitors on display
at our stores

ACER

78iE 17" 1600 x 1200 .26 NI	**(525)*

ARTMEDIA (Sony oem)

TX1664 15" 1280 x 1024 .25 NI	**(309)*
TN1885 17" 1600 x 1280 .25 NI	769
TX1864 17" 1280 x 1024 .25 NI	599
GT960T 20" 1600 x 1200 .25 NI	1489
TN2185T 20" 1600 x 1200 .30 NI	1285

HITACHI SuperScan

CM500U 15" Flat 1280 x 1024 .28 NI, 65hz	**(289)*
CM620U 17" Flat 1280 x 1024 .28 NI	545
CM630U 17" Flat 1600 x 1200 .28 NI	675
CM751 19" 1600 x 1200 .26 NI, 75hz	1019
CM2011M 20" 1600 x 1200 .28 NI	1165
CM800U 21" 1600 x 1200 .22 NI	1389
CM802U 21" 1600 x 1200 .22 NI	1639
CM803U 21" 1800 x 1440 .22 NI, 77hz	1675

IBM (touch screen)

G41T 14" Touch Monitor .28	895
G50T 15" Touch Monitor .28	985
G70 17" 1280 x 1024 .28, 60hz, FST	785
G70T 17" Touch Monitor .28	1465
P70 17" 1600 x 1200 .26, 60hz	995
G200 20" 1600 x 1200 .28, 60hz	1385
P200 20" 1600 x 1280 .31, 60hz	1785
P201 20" 1600 x 1200 .26mm, 85hz	2445

IIYAMA

SALE

(3 yr warranty)

MF-8515G 15" 1280 x 1024 .28 NI	**299**
MF-8617E 17" 1600 x 1200 .26, 69hz, NI	**535**
MT-9017E 17" 1600 x 1200 .25, 72hz, NI	**625**
MF-8221E 21" 1600 x 1280 .22, 76hz, NI	**1285**
MF-8721 21" 1800 x 1440 .22 NI, 74hz	**1395**
MT-9021E 21" 1600 x 1280 .30, 76hz, NI	**1269**
MT-9221E 21" 1800 x 1440 .28 NI, 74hz	**1455**

IMPRESSION

3 Plus 14" 1024 x 768 .28 NI	179
5 Plus 15" 1280 x 1024 .28 NI	235
7 Plus 17" 1280 x 1024 .28 NI	465
Vienna Pro 17" 1600 x 1280 .25 NI	579

KFC

CA1515DS 15" Flat 1280 x 1024 .28	**(225)*

KOMODO (2 yr warranty)

H73 17" 1280 x 1024 .28 NI, Digital	415

MAG

DX15T 15" 1280 x 1024 .26 NI	**(339)*
DJ702 17" 1280 x 1024 .26 NI	**(569)*
DX700T 17" 1280 x 1024 .25	635

MAXTECH (GVC, 3 yr warranty)

XT-7800 17" 1280 x 1024 .28 NI	459

NANAO

FX-C5 17" 1280 x 1024 .26 NI	**(665)*
FX-C6 17" 1280 x 1024 .26 NI	**(749)*
TX-C7S 17" 1600 x 1200 .25, Trinitron	999
TX-D7S 20" 1600 x 1280 .30 NI	1675
FXE8 21" 1600 x 1280 .26 NI	2245

NEC

A500 15" 1280 x 768 .28 NI	339
E500 15" 1280x1024 .25 NI	369
M500 15" 1280 x 1024 .25 NI	389
A700 17" 1280x1024 .28 NI	599
E700 17" 1600 x 1280 .25 NI	679
M700 1280 x 1024 .25 NI	**(759)*
P750 17" 1600 x 1200 .25	849
E1100 21" 1600 x 1200 .28 NI	**(1299)*
P1150 21" 1600 x 1200 ,25, 75Hz.	**(1445)*
XM3750 37" 1024 x 768 Multimedia Monitor	5475
XP3778 37" 1280 x 1024 Data Monitor	7795

NOKIA

447L 17" 1024 x 768 .28 NI	**(569)*
447XAV 17" 1600 x 1280 .25 NI	985
447Xi 17" 1600 x 1280 .25 NI	**(795)*
445XAV 21" 1600 x 1280 .26 NI	1845
445Xi 21" 1600 x 1200 .26 NI, TCO95	**(1499)*

OPTIQUEST

V655 15" 1280 x 1024 .28 NI, Digital	329
V775 17" 1600 x 1200 .26 NI	625
V95 19" 1600 x 1280 .26 NI	859
2082DC 20" 1600 x 1200 .28	1199

PRINCETON

EO70 17" 1280 x 1024 .28 NI	489
EO75 17" 1600 x 1280 .26 NI	589
E090 19" 1600 x 1200 .26 NI	859
Ultra 17+ 17" 1600 x 1280 .8 NI	579

SAMSUNG

17GLSi 17" 1600 x 1280 .26 NI, TCO92	**(699)*

SCEPTRE (3 yr warranty)

P401 14" 1024 x 768 .28 NI, Digital	**(175)*
P511 15" 1280 x 1024 .28 NI, Digital	**(219)*
P73 17" 1280 x 1024 .28 NI, Digital	419
P73A 17" 1280 x 1024 .26 NI, Digital	465
P73B 17" 1280 x 1024 .26 NI, Digital, Black	479
P75A 17" 1600 x 1200 .26 NI, Digital	**(515)*

LCD PANEL: (1 yr warranty)

CD-1111S 11.3" DSTN, 800 x 600, 64k color	875
CD-1112T 12.1" TFT, 800 x 600, 256k color	1725
FT15 15" TFT LCD 1024x758 Color	2499

SHAMROCK

SRC-1407 14" 1024 x 768 .28 NI, Digital	179
SRC-1502L 15" 1280 x 1024 .28 NI, Digital	225
SRC-703LD 17" 1280 x 1024 .28 NI, Digital	459
SRC-705 17" 1600 x 1280 .26 NI, Digital	485

SONY

CPD-100SF 15" 1280 x 1024 .25, 60hz	**(359)*
CPD-100SX 15" 1280 x 1024 .25, 60hz	345
17SEII 17" 1600 x 12000 .25 NI, plug & play	**(869)*
CPD-200SF 17" 1280 x 1024 .25 NI, 75hz	699
CPD-200SX 17" 1280 x 1024 .25 NI, 60hz, PNP	629
20SEII 20" 1600 x 1200 .25 NI	1735
CPD-300SFT 20" 1280 x 1024 .30, 80hz	**(1299)*

TVS

9" 1024 x 768 VGA Mono	119

ViewSonic

E641 14" 1024 x 768 .28 NI	205
E655 15" 1024 x 768 .28 NI	289
15GA 15" 1280 x 1024 .28 NI, built-in speakers	**(375)*
15GS 15" 1024 x 768 .28 NI	315
17EA 17" 1280 x 1024 .28 NI, plug & play	565
17GA 17" 1280 x 1024 .27 NI, plug & play	**(625)*
17PS 17" 1600 x 1280 .25 NI, PnP, TCO	**(645)*
G771 17" 1280 x 1024 .27 NI	535
GT770 17" 1280 x 1024 .25	645
P775 17" 1600 x 1280 .25 NI	699
PT770 17" 1600 x 1280 .25	**(689)*
PT775 17" 1600 x 1280 .25, Sonictron	799
G800 20" 1600 x 1280 .28 NI	**(1035)*
GT800 20" 1600 x 1280 .30, Sonictron	1129
G810 21" 1600 x 1280 .30	**(1349)*
P810 21" 1600 x 1280 .25	**(1295)*
P815 21" 1800 x 1440 .25 NI	**(1435)*
PT813 21" 1600 x 1280	**(1389)*
29GA 29" 1280 x 1024 .75 stripe pitch	**(2195)*

VIEWTRONIC

DX-1764Q 17" 1280 x 1024 .26 NI	419

WYSE

WY-15E 15" 1280 x 1024 .28 NI	399
WY-17E 17" 1280 x 1024 .28 NI	645
WY-17PS 17" 1280 x 1024 .25 NI	825
WY-55 Terminal 14" Amber/ Green/ White	275 ea.
WY-60 Termianl 14" Amber/ Green/ White	359 ea.
WY-65 Terminal 14" Amber/ Green/ White	345 ea.

ACCESSORIES :

VGA Monitor Splitter : 4 Port / 8 Port	155/195
VGA, Keyboard Switch : 4 Way	19.95
VGA, Keyboard & Mouse Switch : 2 Way	24.95
VGA, Keyboard & Mouse Switch : 4 Way	34.95

12. MOTHERBOARDS

ASUS (w/o cpu)

P2L97 ATX 440LX chipset	225
P2L97S ATX 440LX chipset, w. SCSI	315
P2L97DS ATX 440LX, dual, w. SCSI	479
P55T2P4 586-200, PCI, 512k, Burst SRAM	149
TX97 512k,, TX chipset, w. Dimm socket	167
TX97E 512k, TX chipset, 4 Simm/ 2 Dimm	169
TX97X ATX, 512k, TX chipset, Dimm	169
TX97XE ATX 4Simm/2Dimm 512k / w. Sound	175/199
TXP4 512k, TX chipset	155
XP55T2P4 586-200, PCI, ATX, 512k Burst SRAM	155

FIC (w/o cpu)

PA-2007 586-200, 1MB Via, AT, IDE, I/O	125
PA-2011 586-200, 512k Via, ATX	125
PT-2006 586-200, 512k, T3, IDE I/O	99
PT-2007 586-200 512k TX, AT, IDE I/O	119
PT-2011 586-200, 512k, TX, ATX, IDE I/O	135
PT-2200 586-200, 512k, T2, IDE I/O	109

intel. (w/o cpu)

AN430TX ATX, 512k w. Sound	195
AN430TX ATX 512k w. Sound, 2MB SVGA	235
LT430TX ATX 512k IDE I/O	179
Portland Pentium® II 440FX / w. audio	225/245

J-BOND (w/o cpu)

PCI500C-G2: P-200, 4PCI, EIDE, 430HX, 512k	**(109)*
- w. AHA-2940UW SCSI on board, 512k	**(199)*
PCI500C-H4: Pentium® II 266Mhz, 512k, VX (support Intel, K5, K6, Cyrix CPU)	99
PCI500C-J: P-300 CPU Alarm, ATX.	129
-w. AHA-2940UW SCSI on board	259
PCI600A: Pro-200, 4PCI, IRDA, 440FX, ATX	189

M-TECH (w/o cpu)

Mustang-R534 586-200Mhz, 512k, w. IDE I/O	139
M549 512k Super TX chipset, 4 Simm/ Dimm.	95
R539 512k, TX chipset, 4 Simm / 2 Dimm, EIDE.	135
R543 Cyrix Media GX, 150Mhz, VGA/ Audio	159
R557 512k, TX chipset, ATX, 4 Simm / 2 Dimm	149
R653 Pentium® II 440FX, ATX, EIDE I/O	209

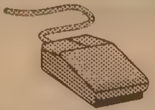
SUPERMICRO USA (w/o cpu)

P5MMA98 ATX w. 512K TX chipset	165
P5MMS98 w. 512k TX chipset	159
P6DNE Pro 200Mhz, dual Pentium® slots	315
P6DNF Pro 200Mhz, dual Pentium® slots, w. IDE I/O & 440FX chipset	**(339)*
P6DKF Pentium® II Dual, 440FX, IDE I/O	359
P6DLS Pentium®II, Dual, 440LX, w. 2940 SCSI	479
P6SAS Pro 200Mhz, 2940UW, ATX	299
P6SKE-II Pentium® II 440FX, ATX, EIDE I/O	225
P6SKS Pentium® II 440FX, ATX, SCSI & EIDE	335
P6SNE-II Pentium II 440FX IDE, I/O	225
P6SNS Pro 200Mhz, w. 2940UW	299

TYAN (w/o cpu)

1564D Tomcat IV, 512k 430HX	199
1564S Tomcat IV, 512k, 430HX	165
1571S w. 512k, 430TX chipset	149
1573S w. 512k, 430TX chipset, ATX	147
1680S Pentium® II 512k, ATX	229
1682D P-II, Dual, 440FX	**(329)*
1686S P-II, 440FX ATX	239
PS/2 Mouse Connector	6
Riser Card for Tahoe PII	49

13. MOUSES & JOYSTICK



KENSINGTON

Expert Bus 5.0	115
Expert Serial & Trackball 5.0	**(89)*
Mouse in a Box	**(26.95)*
Orbit Trackball	**(49)*
Thinking Mouse (Serial & PS/2)	**(55)*

LOGITECH

Cordless Mouseman Pro	69
First Mouse Plus oem	**(29)*
Mouseman 96	52
Mouseman Bus	64
Mouseman Sensa	29
Serial Combo PC & PS/2 oem / reg	27/45
Trackman Live Cordless	125
Trackman Marble for Win'95 oem / reg	59/82

Microsoft

Bus 2.0 400dpi w. Bus Card oem / 5-Pack	65/325
Combo Mouse (Serial + PS/2)	49.95
Easyball w. Freddi Fish CD	49.95
Home Mouse Serial	29
IntelliMouse 3.0 for Win'95	**(69)*
- oem serial / oem PS/2	35/37
PS/2 2.0 (round connector) oem	32
Serial 2.0 400dpi oem	27

MOUSE SYSTEMS

Mousel Serial w. Pad	19
Omni Mouse	26
PC Mouse III (3-button optical)	49.50
PC Trackball II	39.95
ProAgio (5-button serial)	39
Serial Bus Card (9IRQs) - 5 com.	29

NEC

2-button King Mouse	19.99

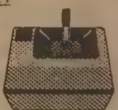
QTRONIX

Libra 90 Pro Trackball	35
Opto-Mechanical Mouse	7.50

OTHERS

AGILER ATB-610 Serial Trackball	19.95
AGILER Bus Mouse	23
ANCER 3-button Black	19
ANTEC Serial Mouse	**(6.95)*
GENIUS Netmouse Serial / PS/2	19.95 ea.
GENIUS Netmouse Combo (serial + PS/2)	24.95

JOYSTICK :



C.H. PRODUCTS

Flight Stick Pro / Pro Pedals	53/79.95
Virtual Pilot / Pro (Yoke)	68/75

LOGITECH

Wingman Extreme oem / reg	*(34)/47
Wingman Standard w. free CD	**(29)*

MICROSOFT

Side Winder 1.0	29
Side Winder 3D Pro	46
Side Winder Game Pad	39

THRUSTMASTER

ACM Gamecard	29.95
F-16 FLCS / F-16 TQS	125/129
F22 Pro Flight Control (programmable)	139
Flight Control System MK II	65
Flight Control System Pro	108
Formula T2	119
Rudder Control	109
UPROM	29.95
Weapon Control MK II	109
Wizzard (pinball controller + Royal Flush CD)	39
XL Action / w. EF2000 game	28/33.95

OTHERS

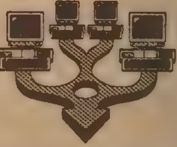
Cobra (by Mouse Systems)	**(9.95)*
Command Pad (by Quickshot)	**(5.99)*
CyberFlight Joystick + Dark Forces	39
Cyclone 3D	43
Dexxa Control Pad w. CD games	18
Game Card (add-on)	**(7.95)*
Gravis Eliminator Game Card 2 Port	19.99
Graivs Game Port Y Splitter	9.95 ea.
PC Analog Pro Joystick	19.95
PC Gamepad Pro	29
Power Ramp (10-in-1 gamdpad)	49.95
Walt Disney Mouse Pad	4.99 ea

- 101 Dalmations - Mickey Mouse
- Pocahontas - Timon & Pumbaa
- Toy Story - Winnie the Pooh

Warner Brothers Mouse Pad	5.99 ea

- Bugs Bunny - Daffy Duck
- Homer Simpson - Marvin the Martian
- Tasmanian Devil
- Tweety & Sylvester - Wile E Coyote

14. NETWORK



Government & Education Pricing
Please Call!

3Com net Working Partners **Networking Partner**

3C250A FMS 100BaseTX Fast 12 Port HUB	**(995)*
3C509B TPO oem	**(49)*

**(sale price) ..... SPECIALS , limited to stock on hand
Prices subject to change without notice.*

http://www.centralcomputer.com for current prices & catalog

15. NOTEBOOKS / DESKTOPS / PALMTOPS

HALLOWEEN SALE - TAKE 2% OFF ALL NOTEBOOKS

Offer Good for Notebooks Only. Ends 11/15/97.

ACER
Extensa 670CD: P-166MMX, 16MB, 1.6GB, 10X CD, 12.1" DSTN 2850
Nuovo 972: P-133Mhz, 16MB, 1.3GB, 6X CD, 28.8 modem, 11.3" DSTN 2495
Nuovo 975: (TM7060) P-166MMX, 32MB, 2GB, 10X CD, 33.6 modem, Li-Ion, 12.1" TFT ..... *(4295)
TravelMate 7060: P-166MMX, 32MB, 2.1GB, 10X CD, 12.1" TFT 3895

AST
Ascentia A60+: P-150, 16MB, 1.4GB, 10X CD, 33.6 modem, 12.1" TFT .... *(2350)
Ascentia A70+: P-150MMX, 16MB, 1.4GB, 10X CD, 33.6 modem, 12.1" TFT .... *(2560)
Ascentia P80: P-166MMX, 32MB, 3GB, 10X CD, 28.8 modem, 12.1" TFT .... *(3650)

CHEM USA

ChemBook 2600:
16MB, 1.4GB, 10X CD, Zoom Video Ready, Win'95, 12.1" DSTN,
- P133/ 166 ... 1795/1875
- P166MMX 1925
- P200MMX 2065
Upgrades:
- to 12.1" TFT .. add 500
- to Li-Ion Battery .... add 100
- to 2GB Hard Drive .... add 120
ChemBook 2700: P-233MMX, 32MB, 2.1GB, 20X CD, Win'95, 14" TFT 3850
- w. 33.6 modem buiot-in .... add 125
ChemBook 6800: 16MB, 1.4GB, 11X CD, 12.1" DSTN, 3 PCMCIA,
- P133 / P150 / P166 .... 1795/1825/1865
- P-166MMX / P-200MMX 1899/2045
Upgrades: (For 6800)
- to 12.1" TFT .... add 500
- to Li-Ion Battery .... add 100
- to 2GB HDD .... add 120
Chembook 9750: 16MB, 2GB, 10X CD, 12.1" TFT, w. Lithium Battery,
- P166 / P200 .... 2665/2765
- P-166MMX / P-200MMX 2735/2875
Upgrades: (For 9750)
- to 32MB RAM Built-in .... add 120
- to 13.3" TFT (frm 12.1" TFT) .... add 625
- to 16X CD-ROM Drive .... add 50

DFI
6600: P150, 16MB, 1.4GB, 10X CD, Win'95, 12.1" DSTN, carrying bag 1770
8120: P-200MMX, 32MB, 2.1GB, 20X CD, Win'95, 33.6 modem, Li-Ion, Battery, Video Capture, Targus Bag, 12.1" TFT .... *(2850)
8241: P-200MMX, 32MB, 2.1GB, 20X CD, Win'95, Li-Ion Battery, Targus Bag, 14.2" TFT 3999

FUJITSU
Lifebook 535TX: P-133MMX, 16MB, 2GB, 20X CD, 33.6 modem, 12.1" TFT 2430
Lifebook 555TX: P-150MMX, 16MB, 2GB, 10X CD, 33.6 modem, leather case, 12.1" TFT 2850
Lifebook 565TX: P-166MMX, 32MB, 2GB, 20X CD, 33.6 modem, 12.1" TFT 4100
Lifebook 655TX: P-150MMX, 16MB, 1.3GB, 33.6 modem, 12.1" TFT .... *(3450)

HITACHI
MX-166T: P-166MMX, 16MB, 2.1GB, 8X CD, 33.6 modem, 10BT, 12.1" TFT 3445
VisionBook Elite: P-166MMX, 16MB, 2.1GB, 10X CD, 56k modem, 13.3" TFT 4450
VisionBook Pro: P-166MMX, 32MB, 2.1GB, 10X CD, 56k modem, 10BT, 12.1" TFT 4150

HP

Authorized Reseller

LAPTOP:

Omnibook 800CS/100 (F1171A): 16MB, 772MB, 10" DSTN 2395
Omnibook 800CT/133 (F1175A): 16MB RAM, 1.3GB, 10.4" TFT .. 3195
Omnibook 800CT/166MMX (F1360A): 16MB, 2GB, 10.4" TFT 3795
Omnibook 2000CS/133 (F1371A): 16MB, 1.34GB, 12.1" DSTN 2150
Omnibook 2000CT/133MMX (F1373A): 16MB, 1.86GB, 12.1" TFT 2769
Omnibook 5700CT/150MMX (F1352A): 16MB, 2GB, 12.1" TFT 3045
Omnibook 5700CT/166MMX (F1353A): 16MB, 2GB, 12.1" TFT 3775
Upgrades: 10X CD Rom (F1347A): for 2000 / 5500 /5700 299

PALMTOP:

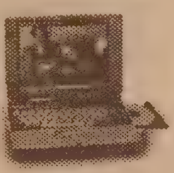
200LX 80 column 4MB (F1216A) 545
_320LX 4MB, 640 x 240 (F1221A) .... *(525) 549_
Accessories: (for 320LX)
- (F1218A) AC Adapter 29.99
- (F1223A) Synch Cable 16
- (F1224A) Spare Cradle 32
- (F1227A) Leather Case 68
- (F1225A) Stylus 12

IBM

ThinkPad 760
TP560: P-133Mhz, 8MB, 2.1GB, 12.1" TFT 3795
TP560: P-133, 8MB, 2.1GB, 11.3" DSTN, ($50 rebate) .. - <ask for details>. ... *(1599)
TP760EL: P-133, 16MB, 2.1GB, Win'95, 12.1" TFT. 4645
TP760XD: P-166MMX, 32MB, 3GB, 8X CD, 28.8 modem, 12.1" TFT 4795
TP760XL: P-166MMX, 16MB, 2.1GB, 12.1" TFT . 3899
TP765D: P-166MMX, 32MB, 3GB, 8X CD, 28.8 modem, 13.3" TFT 5650

PSION (palmtop)
Series 5 w. 4MB / 8MB 529/635

SCEPTRE
S3900: 8MB, 1.3GB HDD, 11.3" DSTN, Win'95,
- P100 / P133 / P150 .... 1355/1399/1555
S4000: 8MB, 1.3GB, 10X CD, 12.1" TFT, Win'95, Li-Ion,
- P100 / P133 / P150 .... 2199/2299/2399
Upgrades: (for S3900 & S4000)
- to 2GB HDD .... add 125
- w. 16MB built-in .... add 75
- w. 32MB built-in .... add 195
S4500: P-166MMX, 16MB, 12X CD, 33.6 modem, Li-Ion
- 1.3GB / 2GB HDD 2999/3065

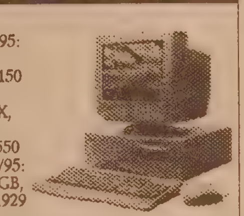
TOSHIBA

Libretto 50CT: P-75, 16MB, 810MB, 10.6" TFT 1999
Portege 660CDT: P-150Mhz, 16MB, 1.35GB, 10X CD, 28.8 modem, 11.3" TFT .... *(4050)
Satellite 220CDS: P133, 16MB 1.4GB, 10X CD, 12.1" DSTN. 2150
Satellite 440CDX: P-133MMX, 16MB, 1.35GB, 10X CD, 12.1" FSCAN 1999
Satellite Pro 440CDT: P-133MMX, 16MB, 1.4GB, 10X CD, 12.1" TFT 2799
Satellite Pro 460CDT: P-166MMX, 32MB, 2.02GB, 10X CD, 33.6 modem, 12.1" TFT 3750
Tecra 500CDT: P-120, 16MB, 1.2GB, 6X CD, 28.8 modem, 12.1" TFT 2475
Tecra 510CDT: P-133, 16MB, 2.1GB, 12.1" TFT, 10X CD, 28.8 modem 2950
Tecra 730XCDT: P-150MMX, 16MB, 1.2GB, 6X CD, 28.8 modem, 12.1" TFT 3699
- with docking station 4195
Tecra 740CDT: P-166MMX, 16MB, 3GB, 10X CD, 28.8 modem, 13.3" TFT 5195
- with docking station 5750

TWINHEAD
Slimnote 9133T: P-133, 12.1" TFT, 10X CD, 33.6 modem, Win'95, Lithium-Ion,
- w. 16MB & 1.3GB HDD 2675
- w. 16MB & 2.1GB HDD 2845
- w. 32MB & 2.1GB HDD 2995
Slimnote 9133V: P-133, 16MB, 1.3GB, 10X CD, Win'95, 11.3" DSTN 1895
Upgrades: (for 9133V): - w. built-in modem ... add 175
- w. 16MB RAM add-on .... add 195
- to 11.3" TFT .... add 525
- w. Lithium Ion Battery .... add 100
Slimnote 9150T: P-150, 32MB, 2.1GB, 10X CD, Win'95, 33.6 modem, Lithium-Ion, 12.1" TFT 2995
Slimnote 9166T: P-166MMX, 32MB, 2.1GB, 10X CD, 33.6 modem, Win'95, Li-Ion 12.1" TFT, ... 3095
- upgrade to LCD 1024x768 .... add 200

US ROBOTICS
Palm Pilot Personal 512k .... *(259) 279
Palm Pilot Prof. 1MB .... *(359) 369
- Belt Crib Case 24
- Cradle for Windows 29
- Deluxe Leather Case 58
- Palm Pilot Modem / Pen 3-pk 129/7.99
- Slim Leather Carrying Case (1010U) 25

ACCESSORIES
Kensington: Notebook Carrying Case 28.95
Kensington: Wet Suite for palmtop 11.50
Kensington: Saddle Bag (Brown) .... *(59.95)
Kensington: Port: MicroSaver .... *(35.95) 39.95
Port: DEFCOM I (motion-sensor) 49
Targus: Leather Convertible Backpack (CLC-1) 89
Targus: Notepad Case (CN01) .... *(24.95) 29.95
Targus Notepad Plus (CNP-1_ 45
Targus: Player Pad Case (23125) 49.95
Targus: Universal Carrying Case (CUN-1) 65

DESKTOP SYSTEMS

AST

Bravo LC6233 2000X/95: PII-233, 32MB, 2GB, 16X CD, Win'95 ...2150
Bravo MS5166M 2000C/95: P-166MMX, 32MB, 2GB, 16X CD, Win'95 1550
Bravo MS5200 3000C/95: P-200MMX, 32MB, 3GB, 16X CD, Win'95 ... 1929

DIGITAL
Celebris FX2: P-200MMX, 32MB, 3.2GB, 12X CD, Win'95 1999
Prioris XL6200: Pro-200, 32MB, 2GB, 12X, Win'95. 2750
Venturis FX2: P166, 16MB, 2GB, 12X CD, Win95 . 1195

HP
Vectra (D4731A): P-166MMX, 16MB, 2.5GB, 16X CD, Win'95 1265
Vectra (D4737A): P-200MMX, 32MB, 3.8GB, 16X CD, Win'95..... 1745
Vetra XA (D5374N): P-233MMX, 32MB, 2.5GB, 8X CD, 10BT, Win NT 4.0, 3-yr warranty 2249

IBM
300GL (628238U): P166,16MB, 2.5GB,16X, Win'95 1145
300XL (658812U): PII-233, 32MB, 2.5GB, 16X CD, Win'95 2050
300XL (65881U): PII-266, 32MB, 4.3 GB, 16X CD, Win NT 4.0 2650

NETOWRK (con't)

3C509B-TPC (TP + BNC) oem / reg .... *(69)/115
3C509B Combo / 5-Pack 119/499
3C515-TX Fast 10/100 ISA oem / reg. 129/145
3C562D PC-Card Modem 33.6 + Lan TPO ... *(269)
3C562D PC-Card Modem 33.6 + Lan Combo .. *(299)
3C575TX 10/100 PC Card 155
3C589D PCMCIA TP / 5-Pack .... *(139)/675
3C589D PCMCIA Combo / 5-Pack .... *(179)/875
3C597-TX EISA 10/100 TP 239
3C862 Impact ISDN U-Interface w. NT1 Int .... *(195)
3C882 Impact IQ ISDN with V.32bis Ext ...... *(265)
3C900 PCI TPO 105
3C900 PCI Combo oem / reg .... *(99)/135
3C905-TX PCI 10/100 TP oem / reg .... *(75/99)
3C16170 Link Builder (12TP) .... *(299)
3C16405 Port Switch 40 Hub 12 Port .... *(395)
3C16406 Port Switch 40 Hub 24 Port 895
3C16590 Dual Speed 12 Port Hub 1195
3C16591 Dual Speed 24 Port Hub 1845
3C16670A Superstack II 12 Port Hub .... *(469)
3C16671A Superstack II 24 Port Hub .... *(799)
3C16700 TPO Office Connect HUB (8TP) ...... *(95)
3C16701 TPC Office Connect HUB (8TP + BNC) .. *(129)
3C16720 Office Connect 100 HUB 8 Port ...... *(665)
3C16730 Office Connect 10/100 Switch 4TP 1 Fast .. *(775)
3C16900A Switch 1000 24 Port 1 Fast .... *(2275)
3C16901A Switch 1000 12 Port 1 Fast 1599
3C16941A Switch 3000TX 8 of 100TX Port 1975
LANPLEX products .... call

adaptec
ANA-6901 32 PCI Full Duplex TP / Combo .. *(85/99)
ANA-6910TX PCI Fast-TX, 32 bit bus mastering .. 175
ATM 25.6Mb/s PCI with 128k / 512k 299/389
ATM 155 Mb/s 512k PCI UTP 725
EM525 Ethernet 16 Combo .... *(39)
EM932 EISA 32 bit Coax / TP .... *(98/99)

ALLIED TELESYN
3012TR Workgroup Hub 12 Port (12TP+AUI+BNC) ... 165
3016TR Workgroup Hub 16 Port (16TP+AUI+BNC) .. 189
3024TR Workgroup Hub 24 Port (24TP+AUI+BNC) .. 249
MC12T: UTP - BNC Conversion Kit 119
MR415T Mini Hub 4 Port 54
MR815T Mini Hub 8 Port 64
MR820TR MicroHub 8 Port (8TP + AUI + BNC).. 115
MX26F Fiber Optics Transceiver 145
MX40F Fiber Optics Transceiver 139

APOLLO
PCMCIA Lan Ethernet Adapter Combo 79

ARTISOFT
Extra Mail for Win'95 215
I-Share 2.5 (internet for Lantastic), 32 sessions 179
Lantastic 7.0 for Single - CD / FD 85/89
Lantastic 7.0 10-user - CD / FD 355/359
Lantastic 7.0 1-user Add On 129
Lantastic 7.0 Starter Kit 2-user - CD+FD 249
Lantastic 7.0 Unlimited User - CD 725
Lantastic PowerSuite :
- 1 / 5 / 10 / 25-user 149/599/1075/2295
- conversion for 1 / 5 / 10-user 89/345/595
NR-Pro 2000A Combo / 10-pack 85/755
NR-Pro 2000T TP / 10-pack 79/625

ASANTÉ
10T HUB 8 Port (8TP + 1BNC) .... *(125)
10T HUB 12 Port (12TP + 1BNC + 1AUI) ... *(219)
10T HUB 24 Port .... *(345)
Fast 100BaseTX 12 Port Hub, stackable .... *(1475)
Fast 100BaseTX 12 Port PNP .... *(1195)
FriendlyNet 5 Port Hub TP .... *(62)
FriendlyNet 8 Port Hub TP 69

ASCEND
P15-1UBRI: ISDN .... *(285)
P25-1U-FX: ISDN Pipeline 25 + 4 Ethernet .... *(435)
P25-1U-PX: ISDN Pipeline 25 + IP Routing ... *(499)
P50-1UBRI: ISDN Pipeline 50 .... *(565)
- w. Secure Firewall P50 .... add 335
P75-1UBRI: ISDN Pipeline 75 .... *(635)
- w. Secure Firewall P75 .... add 335
P130-UBRI-FT1: ISDN .... *(1245)
- w. Secure Firewall P130 .... add 645
MAX200+ (M201 - 4BRIU) 2975
MAX1800 (MX18 - 8BRIU) .... *(4995)

Bay Networks
AT2202001 Bay Stack 100BT 12 Port 1595
CG1001E01 Bay Stack 12 Port 599
CG1001E02 Bay Stack 24 Port 975
Lattislink 2800A: 16TP + 1AUI 559
Lattishub 2803: 16TP + 1AUI Stackable 599
Lattisswitch 28115R 10/100 TP 16 Port 7795
NetGear FE108: 8 Port 100 Hub, non-stackable 375
NetGear FE508: 8 Port Fast 100 Hub 549
NetGear FE516: 16 Port Fast 100 Hub 965

CASTELLE
FaxPress 1500N Ether 1 Line for NW & NT 1995
Office Connect CD Rom Server 569
Office Connect Ether 2P Printer Server .... *(299)
Office Connect Ether 1 Line Fax Server 1195

CHEYENNE
Arc Serve 6.1 for Win - 5 to 25-user (netware).... *(395)
- upgrade Workgroup edition 239
Arc Serve 6.1 for Win - 50 to 1000-user 1095
- upgrade Workgroup edition 415
Arc Serve 6.0 for Win NT 4.0 Single Server ..... *(399)
Arc Serve 6.0 for Win NT 4.0 Enterprise .... *(699)
Arc Serve 6.0 for Win NT Workstation 185
Arc Serve for Mac - 5 / 20-user 159/309
Arc Solo Backup s/w for Dos / for Win 119/118
Fax Server NLM 5.0 - 5 / 10 / 25-user 355/639/999
Inoculan for Netware Server 4.0 Unlimited 585
Inoculan for Win'95 (Anti-Virus) 45
Inoculan for Win NT Server 575
Inoculan for Win NT Workstation Client 46

CISCO
CPA-762 ISDN BRI w. NT1 525
CPA-1604 Bridge w/ NT1 1295
CPA-2501 Router 1 Ethernet / 2 Serial 1695
CPA-2514 Router 2195

CNet (Advanced Network)
2000E+ PNP ISA Combo 27
4020ERP 2 Port Coax Repeater 165
8800TPC HUB: (8TP + BNC) .... *(75)
8816TPC HUB: (16TP + BNC) .... *(159)

DANPEX
2900P2 PCI Combo .... *(29)
3270 Emulation for PC / for PS/2 .... 175/195
5250 Emulation for PC / for PS/2 .... 199/235
6200P2 PCMCIA (type II) BNC+TP 79
9400P3 32bit PCI Combo (DEC, full duplex) .... *(45)
EN-500 5 Port HUB TP .... *(49)
EN-1600 16 Port HUB R.M. .... *(155)

*(sale price) ..... SPECIALS , limited to stock on hand
Prices subject to change without notice.

(oem) .... $, bundled with hardware only

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EN-3200 32 Port HUB R.M.	255
ER-200 2-port Repeater Coax	175
ER-400 4-port Repeater Coax	249
ET-109 Converter (10BaseT to BaseFL)	169
ET-509 Translator (UTP to BNC)	109
ET-510 Translator (UTP to AUI)	107
FE-1000TX ISA 10/100BaseTX	**(48)*
FE-1400TX PCI 10/100BaseTX	**(49)*
Print Server (2P 1S) NW / Unix / Appletalk	**(235)*

DIGI INTERNATIONAL

IMAC Bridge 1 ISDN	1165
IMAC Bridge Dual IMAC	1595
PC IMAC - ISA: Server, 1 ISDN	525
PC IMAC / 4-1: Multi-ISDN Expansion	665

FARALLON

Mac & PC Connection products	Call

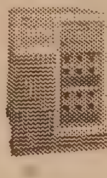
FRONTIER

Super TCP / SuperWeb	Call

HEWLETT PACKARD

Advanced Stack 8 Port HUB (J2610B)	245
Advanced Ethernet Hub 8E (J3128A)	185
J2550B Jet Direct TP	299
J2552B Jet Direct Combo	345
J2556B JetDirect 10/100 Combo	**(399)*
J2573A 10/100 VG Selectable ISA	169
J2585B 10/100 VG Selectable PCI	135
J2590A Jet Direct EX Plus 3 for 100VG	549
J2591A Jet DirectEX Plus Combo	**(285)*
J2593A Jet DirectEX Plus 3 Combo	385
J3175A Advanced Switch 208T	1045
J3200A Advanced Switching 12 Port	425
J3201A (J3200A) + SMNP (J3210A)	**(499)*
J3202A Advanced Switching 24 Port	825
J3203A (J3202A) + SMNP (J3210A)	**(899)*
J3245A Advancestack Switch 800T	2145

HP NETSERVER :



D4841B 6/200 LH PRO Pro 200, 32MB /1GB max ECC, 256k L2, 6-hot swap shelves 2 UW SCSI-3 Controller, CD, 3yr onsite warrenty from HP Optional: Redundant Power Supply Upgradable to Dual CPU	6695
D4315B 6/200SMP LX PRO	17295
D4934A E40 P6/200	2650
HP Support Pack (Extended Warrenty)	call

IBM

Token Ring 16/4 Turbo ISA (72H3482)	245
Token Ring PCMCIA 16/4 Auto	325

intel.

SALE

EE110TX 8 Port Fast Hub, non-stackable	459
EE110TX 12 Port 10 & 100 Dual Speed Hub	**(799)*
EE110TX 24 Port Dual Speed Hub	1685
EILA 8265 PRO/100 for EISA	**(199)*
ES101-TX Switching Hub 10/100	**(2099)*
EtherExpress Pro 10 bit cards :	
- PCLA 8210 BNC+TP oem / reg / 5-pk.	**(65/95/325)*
- PCLA 8220 TP reg / 5-Pack	**(89/315)*
- PCLA 8205 Flash BNC+AUI+TP	135
- PCLA 8215 Flash BNC + TP	125
- PCLA 8225 Flash TP	*115*
LANdesk Virus Protect 4.0	945
MBLA 1600 PCMCIA 10/100	**(149)*
PCLA 2451 Netport Express Pro/100, 3 Port, Ext	335
PCLA 3151 Netport Express Pro Int.	295
PCLA 4451 Netport Express Pro/100, 1 Port, Ext	235
PILA 8465B PRO/100 PCI TP oem / 5-Pack	**(65/375)*
PILA 8480 Pro 100 Server Adapter	485

KINGSTON

Etherx 10/100 Fast PCI	59
Etherx 10BT PC Card	95

LANPRO

EN2000PXA PNP Full Duplex Combo	**(27)*
- w. Novell Personal Netware	**(49)*
EN5200PX PCI Combo	**(32)*
EN9120TX 10/100TX PCI Card	**(39.95)*
Fast 100 hub 5 Port Stackable	**(225)*
Fast 100 HUB 8 Port Desktop / Stackable	**(335/425)*
Fast 100 HUB 12 Port	**(599)*
HUB : 5 Port (5TP)	**(55)*
HUB : 8 Port (8TP + BNC)	**(69)*
HUB : 16 Port (16TP + BNC) Desktop	**(125)*
PS1000A Print Server Single Port	139
SD200 2 Port Easy Switch 10BT & 100TX	445

LINKSYS

Fast 100TX 4 Port Hub Stackable	**(185)*
Fast 100TX 8 Port Hub	359
Fast Switch 10/100 TX 2 Port	275
Fast Switch 10BT & 100TX 5 Port	1195

MEGAHERTZ

XJ10BC PCMCIA Ethernet Combo	**(135)*
XJ10BT PCMCIA Ethernet TP	**(115)*
XJEM 3336C Modem 33.6 + Lan Combo	**(279)*
XJEM 3336T Modem 33.6 + Lan TP	**(249)*

MICRODYNE (Eagle)

EH1200E 12 Port HUB	**(175)*
NE 10/100 ISA	**(89)*
NE 10/100 PCI	**(99)*
NE2500 Combo, plug & play oem	**(35)*
NE5500 32 bit PCI Combo	**(109)*

MICROTEST

CD-Now for Netware: 25-user / 50-user	489/695
Disc View Pro	265
Disc Serv (includes Disc View)	529

NOVELL.

SALE

Intra Netware Kit for Small Business: (server + 5-user + 2 Danpex ISA Combo + 5 port 10BT hub)	*(545)

Intra NetWare 4.11:	
- 5 / 10 / 25-user	**(695/1295/2095)*
- 50 / 100-user	2895/3995
- 250 / 500 / 1000-user	7295/15995/30995
Intra Netware for Small Business (for < 25-user):	
- Server + 5 License	599
- 1 / 5-user license	59/225
Lan Workplace 5.0 single / 10-user	195/1295
Netware 3.12:	
- 5 / 10 / 25-user	**(675/1295/1895)*
- 50 / 100-user	2695/3495
Netware Connect 2 Ports / 8 Ports	355/1375
Netware Connect 32 Ports	3895
Netware NFS v1.2C	**(1850)*
Netware NFS Service 2.1	2195
NFS Client for Lan Workplace	205
Unixware Personal Edition v2.01 - CD version	**(99)*
Unixware SDK v2.1 - CD version	**(75)*

PALINDROME

Network Archivist NLM 3.1A Backup	**(195)*

SHIVA

LanRover/2E Plus 3.5 Async TP v.34	1695
NetModem/E 28.8 Ether BNC + TP	1295

SMC

Ether EZ TP (8416T) oem	**(58)*
Elite Ultra 32 EISA Combo	**(195)*
Etherpower PCI Combo (8432BT) oem	**(85)*
Etherpower II 10/100 (9432TX) oem / 5-pk	*(65)/335
EZ Hub 100TX 8 Port	635
Tiger HUB: 100TX 12 Port	1195
Tiger HUB: 3212TC (12TP + BNC + AUI)	349
Tiger HUB: 3314T 14 Port	**(459)*

WISECOM (5 yr warranty)

D300CT PCI Bus Mastering	**(33)*
H008CAT 8 Port HUB (8TP + AUI + BNC)	**(75)*
HI16CAT 16 Port HUB (16TP + AUI + BNC)	**(139)*
R300CT PCI 32 bit Combo PnP	**(29)*
U210CT NE2000 ISA Combo, PnP	24

XIRCOM

CE3-10BT PCMCIA TP, upgradable	135
CE3-100BTX 10/100 PCMCIA	155
CEM33-BC 33.6 Modem + Lan Combo	**(299)*
CEM33-BT 33.6 Modem + Lan TP	**(255)*
CEM56-100BTX: 56k Modem + Fast Lan	**(299)*
Net Access 4 port / 8 port	1295/2195
PE3-10BC Pocket Adapter Combo	**(279)*
PE3-10BT Pocket Adapter TP	**(259)*

CABLES & ACCESSORIES :

Custom-made Cables, Cross-Overs available call

16. POWER SUPPLIES

APC

AMERICAN POWER CONVERSION

BF-250 Back-UPS Office Kit ($30 Rebate)	165
BK-280 Back-UPS (200W), 2 out	105
BK-400 Back-UPS (300W), 2 out	154
BK-450 Back-UPS (325W), 4 out	179
BK-600 Back-UPS (425W), 4 out	239
BP-280 Back-UPS Pro PNP, 2 out	149
BP-420 Back-UPS Pro PNP, 4 out	235
BP-650 Back-UPS Pro PNP, 4 out	289
BP-1000 Backup Pro, 6 out	375
SU-450 Smart-Net (486, 586 WS), 4 out	295
SU-700 Smart-Net (486, 586 FS), 4 out	365
SU-1000 Smart-Net (FS & WS), 6 out	495
SU-1400 Smart-Net (950W), 6 out	625
SU-2200 Smart-Net (1600W), 8 out	999
SU-3000 Smart-Net (2250W), 8 out	1645
SU-1000 RM Net	575
SU-1400 RM Net	739
SU-2200 RM 3U	1235
SU-3000 RM 3U	1799
SUVS-420 Smart Value Server, 4 out	239
SUVS-650 Smart Value Server, 4 out	295
SUVS-1000 Smart Value Server, 6 out	415
PowerChute Plus :	
- for Novell	65
- for OS/2, Lan Server, 3 Com	75
- for Unix / Xenix	99
- for Win & Win'95	55
- for Win NT	69
Surge Arrest (PER 7)	17.99
Surge Arrest w. TEL (PER 7T)	22.99
Surge Network Strip (NET 7)	29.95
Surge Protector (P7)	9.99
Surge Station Net 8 / 8N	36/48
Surge Station Pro 8	32
Surge Station Pro 8T2 / 8TV	39/49

PC POWER COOLING

CPUcool for 486 or 586-75 / 133 (1.9")	18.95
CPUcool for 586-150 / 200 (1.9W)	19.95
CPUcool for Pentium® Pro (3.2")	22.95
Silencer Slim 230 for Baby or Mid Tower	69
Silencer 230 Full Tower	89
Silencer 270 for Full Tower	124
- Slim for Baby or Mid Tower	114
Silencer 235 for ATX	84
Silencer 275 for ATX	124
Standard 230 for Full Tower	85
Turbo Cool 300 for ATX	126
Turbo Cool 300 for Full Tower	125
- for Slim (baby or mid tower)	115
Turbo Cool 400 for Full Tower / for Slim	**(176/175)*
Turbo Cool 400 for ATX	199
Turbo Cool 450 for Full Tower (heavy duty)	285
Two-inOne 500 (slim, redundant)	215
Twinpower 900 (redundant)	895

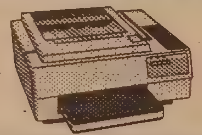
OTHERS

235W for ATX	49
250W for Baby or Mid Tower	29
250W for Baby or Mid Tower, PS/2 (by Kingspao)	45
300W UL for Full Tower , PS/2	49
300W for Full Tower, PS/2 (by Kingspao)	59
RPT-600 300W Redundant for Tower	179

ACCESSORIES

Battery Tester M-032	6.50
DMM: DT-830B (Adc,V,O,Hfe) pocket size	8.95
DMM: DT-890B (A,V,O,C,Hfe)	19.95
DMM: KT-7113 (A,V,O,C,Hfe) auto ranging	24.95
DMM: KT-7244 (A,V,O,F,Hfe)	21.95
DMM: M-3900 (A,V,O,Hfe) big LCD	17.95
DMM: ST-5308 (Adc,V,O,Hfe) battery test	11.95
Engine Tester KT-7181 (Dwell, Tacho)	18.95
Power Center Switching Systems	13.50

17. PRINTERS / PLOTTERS



Printer memory available. Please call for $

ARGOX

Rabit214 Lable Printer w. software	569

BROTHER

HL-720 True 600dpi, 6ppm, Laser	315
HL-730DX True 600dpi, 6ppm, Laser	365
HL-1660 17ppm, Laser, 1200x600dpi	**(1185)*
MFC-4550 5-in-1, 600dpi, Laser, Fax	699
MFC-6550 6-in-1, fax/ copy/ scan/ print etc.	969
MFC-7000FC 6-in-1, fax/ copy/ scan/ print etc.	979

CANON

BJC-70 Color, 720x360dpi, 346cps	**(299)*
BJ-240 Color, 360x360dpi, 4ppm	189
BJC-620 Ink Jet, Color, Par, 720dpi	**(299)*
BJC-4300 InkJet Color	199
BJC-4550 11" x 17", 5ppm, 720x360dpi	475

EPSON

FX-870 9-pin	295
FX-2170 9-pin, Wide (max. 6 copies)	449
LQ-570+ 24-pin	259
LQ-870 24-pin, Par	455
LQ-2070 24 pin, Wide	**(389)*
LQ-2170 24-pin, Wide	549
Stylus 400 Color, 3ppm, 720dpi	**(199) 209*
Stylus 600 Color Inkjet, 720x1440dpi	**(255) 275*
Stylus 800 Color, 8ppm, 720x1440dpi	**(355) 375*
Stylus 1500 720dpi, fit A - C size paper	485
Stylus 1520 Color	759
Stylus Photo (C209011)	**(418) 439*

Accessories :

Black Ink for II & IIS	19.95
Black Ink for 400/ 500/ 600	19.45
Black Ink for 400/ 800+ (SO20025)	10.95
Black Ink for 800 Color/ 1520	22.45
Color Ink for II & IIS	29.95
Color Ink for 400/ 600/ 800	22.95
Color Ink for Stylus Photo (S)20110)	19.95
Coated Letter Paper 720dpi (S041062), 100 sheet	12.95
High Quality A4 Paper (S041111) , 100 sheet	8.95
Inkjet 720dpi A4 (SO41061), 100 sheet	12.45
Iron-On Paper (making T-Shirt)	11.95
Photo Quality Glossy (S041124), 20 sheet	10.95
Photo Quality Legal (S041067), 100 sheet	16.95
Postscript for 800 & 1520	98

HEWLETT PACKARD

Color Laser Jet 5 (C3961A)	3875
Color Laser Jet 5M (C3962A)	4945
Desk Jet 670C (C5884A)	208
Desk Jet 692CXi	285
Desk Jet 820CXi / 870CXi	**(255/369)*
Desk Jet 890CXi	419
Desk Jet 1000CXi (C2673A), print size 4x5 - 11x17.	485
Desk Jet 1600C PC, Mac	1299
Desk Jet 1600CM Postscript PC, Mac	1899
Laser Jet 4V / 4MV (B size)	1795/2595
Laser Jet 5 (C3914A)	999
Laser Jet 5M / 5N	1525/1285
Laser Jet 5Si / 5SiMX	2349/3395
Laser Jet 6LXi	**(377) 389*
Laser Jet 6PXi / 6MP	745/879
Mopier (C4176A) 5Si / Bundle	4445/6545
Office Jet 590 4-in-1 (C4645A)	595
Office Jet Pro 1150C Color (C5300A)	939
Portable 340	295

PLOTTERS

Design Jet 350C: D Size / E Size	2195/2795
Design Jet 750C: D Size / E Size	4995/5695
Design Jet 755CM: E Size	8195

Accessories :

C3067A: Color Kit for 540	**(37)*
C3169A: Postscript for 5Si	435
C3760A: Lower Cassette for 4V / 4MV	325
C3762A: Duplex for 5Si / 5SiMX	479
C3765A: Envelope Feeder for 5Si	379
C3918A: Postscript for 5 / 5N	335
C3920A: Duplex for 5 / 5N / 5M	475
C3921A: 500 Sheet Feeder for 5	225
C3927A: Power Envelope Feeder for 5	259
C4533A: Color Kit for 600	**(39)*

Ink Cartridges :

(HP51626A) Black for 500, 540, 560	24.45
(HP51625A) Color for 500C, 550C, 560C	26.95
(HP51629A) Black for 600, 660	24.95
(HP51649A) Color for 660C	29.25
(HP51645A) Black for 870C, 855C, 1600C	26.95
(HP51641A) Color for 870C, 855C, 1600C	28.95
(HP51640A) Black for 1200C	23.95
(HP51640C) Cyan for 1200C	27.95
(HP51460M) Magenta for 1200C	27.95
(HP51640Y) Yellow for 1200C	27.95
(HPC3105A) Black for Color Laser Jet	7.95
(HPC3102A) Cyan for Color Laser Jet	32.95
(HPC3104A) Magenta for Color Laser Jet	32.95
(HPC3103A) Yellow for Color Laser Jet	32.95

Paper:

92296T: Transparency Film for Laser, Letter, 50 sheet	17.95
C1812A: Greeting Card, Letter, 20 sheet	7.95
C1846A: Photo Paper, Letter, 20 sheet	9.95
C2974A: Glossy, Letter for 5/ 5M, 50 sheet	39.95
C3850A: Opaque Bond Paper 36" x 150' roll	24.95
C3877A: Coated Paper 36" x 150' roll	39.95
C5973A: Premium Glossy, Letter, 25 sheet	21.95
C5976A: Bright White Inkjet, Letter, 200 sheet	5.95

Toner Cartridges :

(HP92295A) Toner for II, IID, III, IIID	75
(HP92275A) Toner for IIP, IIP+, IIIP	74
(HP92291A) Toner for IIISi, 4Si, 4SiMX	129
(HP92298A) Toner for 4, 4M, 4+, 4M+, 5, 5N, 5M.	89
(HP92274A) Toner for 4L, 4ML, 4P	65
(HPC3900A) Toner for 4V, 4MV	139
(HPC3906A) Toner for 5L, 5ML	59
(HPC3903A) Toner for 5P, 5MP, 6P, 6MP	75
(HPC3909A) Toner for 5Si, 5SiMX	179

IBM (network printer)

#4312001: Laser, 12ppm, 600dpi, 4MB	1025
#4317001: Laser, 17ppm, 600dpi, 4MB	1365
#4324001: Laser, 24ppm, 600dpi, 4MB	2345

LEXMARK

Optra C 600dpi, 3ppm color, Postscript, 8MB	4495
Optra E 600dpi, 6ppm, 1MB	395
Optra S1250: 1200dpi 4MB, 12ppm	1045
Optra S1650: 1200dpi, 4MB, 16ppm	1295
Optra S2450: 1200dpi, 4MB, 24ppm, 1250 sheet	2295

NEC

Superscript 860 Laser	**(389)*

OKIDATA

ML184T 9 pin, Par (max. 5 copies)	235
ML320T 9 pin (max. 5 copies, 290cps)	**(325)*
ML390T 24 pin, 312cps, for Win & Win 32	345
ML520 9-pin, 430cps	**(385)*
ML590 24-pin (max. 5 copies)	449
ML591 24-pin, Wide (max. 5 copies)	625
OkiPage 4W Laser 4ppm	**(199)*
OkiPage 6E Laser 6ppm, 600dpi	299
OkiPage 6EX Laser, 6ppm, 600dpi, 2MB	**(409)*
OkiPage 16N Laser 16ppm, 600dpi	889
OL600E Laser, 6ppm, 600dpi	**(295)*
OL610E Laser, 6ppm, 600dpi, 2MB	485
OL810E Laser, 8ppm, 600x1200dpi	**(565)*
OL1200 Laser 12ppm, 600x600dpi, 2MB	**(949)*

SEIKO

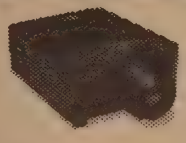
Smart Label Printer EZ30	145
Smart Label Printer Pro	235
Standard Label (2 rolls)	7.95

**(sale price) ..... SPECIALS , limited to stock on hand*
Prices subject to change without notice.

(oem) .... $, bundled with hardware only

http://www.centralcomputer.com for current prices & catalog

18. PROJECTORS



3M

Overhead M9100 AJB	289
Overhead M9200 AJC	399
Overhead M9550 AJH	615
Overhead M9700 AJJ	499

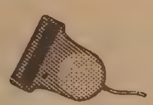
NEC

projectors	call

PROXIMA

Desktop DP5100 LCD	3499
Desktop DP5500 LCD 640 x 480, zoom	4599
Ovation 810 LCD 8.4" 2M Color, 640 x 480	1665
Ovation 944 10.4" LCD 16.7M 1280 x 1024	6395
Ovation+ 840 8.4" LCD 16.7M 800 x 600	2195
Ovation+ 846 10.4" LCD 16.7M 800 x 600	2695
Portable Overhead A653 3000 Lumens	475
Portable Overhead A655 4000 Lumens	799

19. SCANNERS



ACER (flatbed)

AcerScan 300F Color	**(165)*

AVISION

AV100 Color	149
AV360C Color	125

COMMAX

Imager 730 30-bit 960dpi, Parallel Port	119

HEWLETT PACKARD

ScanJet 6100 (C6267A)	**(699)* 745
- Auto Document Feeder (C6265A)	455
- Transparency (C6261A)	599
Scanjet 5P Color/ Grayscale	**(275)*

MICROTEK (flatbed)

Scan Maker III w. TMA & Photoshop OCR	*(1399)
Scan Maker E3 600dpi, 24-bit Color, w.OCR.	*(145)
Scan Maker E6 1200dpi, w. OCR	285
Scan Maker E6 Pro 1200dpi w. Photoshop OCR	499
Scan Maker V300 w. Paperport	165
Slide Maker 35T 1800dpi, 16.8M Color, w. Photostar	725
Auto Document Feeder ADF600	365
Transparency Adapter for E3 / E6	285/285

STORM TECHNOLOGY

Easy Photo Reader Parallel	**(115)*
Easy Photo Smartpage	**(149)*

TAMARACK (Artiscan)

1200C 24-bit color, 300x600dpi, PnP, w. Documan Color & Xerox Textbridge software	139
4800C 24-bit color, 300x600dpi, PnP, w. Corel Photopaint 5 & Xerox Textbridge software	149
ECP-24 24-bit color, 300x600dpi, flatbed, w. Corel Photopaint 5 & Xerox Textbridge software	159

UMAX

Astra 600P Win	**(139)*
Astra 600S w. Photo Deluxe	**(159)*
Astra 1200S Win Deluxe	375
Astra 1200S Win PS	635

20. TAPE BACKUPS

AIWA

TD-S3200 TR-3 Accelerator Card & Seagate BackUp Exec Int	155
GD-B8000 8GB DDS-2 4mm SCSI Int	649

EXABYTE

Eagle TR3 (603003-004) 3.2GB Int w/o card	**(145)*
EXB-8205XL 8mm Dat. 3.5 - 7GB Int / Ext.	1275/1499
EXB-8505XL 8mm Dat. 7 - 14GB Int / Ext	1850/2095
EXB-8700E 8mm 7 - 14GB Ext	925
EXB-8700LT 8mm 5 - 10GB Ext	675

HEWLETT PACKARD

C1534 4mm Dat. 2GB SCSI Int	**(549)*
- w. Int Kit (C1525G) / Ext Kit (C1520G)	725/845
C1536 4mm Dat. 2-4GB SCSI Int	**(595)*
- w. Int Kit (C1526G) / Ext Kit (C1521G)	769/895
C1554 Dat. 24GB DDS-3 Int	1045
- w. Int Kit (C1555A) / Ext Kit (1556A)	1399/1545
C1599 Dat. 8GB DDS-2 Int	765
- w. Int Kit (C1528G) / Ext Kit (C1529G)	965/1095
C5644A Surestore T4i 4GB Travan Int	415
Colorado T3000 3.2GB Travan w. cartridge Int	189
Colorado T4000S 8GB Travan Int	359

IOMEGA

2GB Tape Single	19.95
- 2GB Tape 3-pack	57
Ditto 3200MB (QIC 3010/ 3020) Int	209
Ditto 3200MB (QIC 3010/ 3020) Parallel	239

NOVASTOR (software)

Novaback CD Bundle (multi-platform)	**(59)*

SEAGATE

SALE

CNR-4324RP 2 - 4GB SCSI Int	**(499)*
CNR-4326RP 4mm 8GB SSCSI w. 5.25" rail	**(665)*
Tape Stor w. cartridge 420MB Int	139
Tape Stor w. cartridge 800MB Travan Int	139

Software (Arcada):

Back Up for Windows '95	65
Back Up Exec for Netware WS 7.0	98
Back Up Exec for Netware Enterprise 7.11	845
Back Up Exec for Netware Single Server 7.0	**(299)*
Back Up Exec Netware Server 7.5	435
Back Up Exec for Netware 1 Server 25-user	315
Back Up Exec for Win NT Enterprise 6.11	795
Back Up Exec for Win NT Server 6.11.	**(295)*
Back Up Exec for Win NT Workstation.	189
Back Up Exec for Win NT Enterprise 7.0	839
Back Up Exec for Win NT Server 7.0	429

SONY

LanBacker 7000: 8GB DDS-2 w. ArcServe Single Server Internal / External:	1095/1175
WanBacker 7000: *GB DDS-2 w. ArcServe Enterprise Internal / External	1695/1795
WanBacker 9000: 24GB DDS-3 w. ArcServe Enterprise Internal / External	2150/2175

TAPE CARTRIDGES:

3M - 4mm 90M	7.50
- 8mm 112M	6.95
- MC3000XL (680MB)	26.50
- Travan (800MB) TR-1	27.95
- Travan (1600MB) TR-3 / TR-4	29.95/34.95
EXABYTE - 8mm 112M, 5GB	9.95
- 8mm 160MXL (for XL drives)	15.95
- 18C 8mm Cleaning Cartridge	19.95
- EXMC 3000XL (1GB)	26.95
- MC3000XL (680MB)	21.95
HP - 92283B 4mm 90M (2GB) / 5-pk	7.50/35
- 92283K 4mm Cleaning Tape 2-pk	21.95
- 92300A 4mm 120M (4GB) / 5-pk	12.95/59
- C1517A 4mm 125M (12GB) DDS-3	27.99
- C1572A 4mm 120M Autoloader	119
- Travan for DT-1000 / 2-pk / 3-pk	29.95/54.95/82
MAXELL - 4mm 90M Dat.	**(7.99)*
- DC2120 (QIC80)	9.95
- DC2120XL (350MB)	16.95
SONY - 4mm 120M for DDS	25.95
- 4mm 90M for DDS-1	8.95
- QIC-Wide 3010 (850MB)	24.95
- QIC-Wide 3020 (1.7GB)	27.95

21. VGA CARDS

ATI

3D Expression Plus 4MB PCI, PC2TV	**(119)*
3D Pro Turbo 4MB PCI, PC2TV	**(169)*
3D Pro Turbo 8MB PCI, PC2TV	**(225)*
All-in-1 Wonder 4MB PCI	**(239)*
Xpert@Play PCI w. 4MB / 8MB	195/255
Xpert@Work PCI w. 4MB / 8MB	179/235

ASUS

V3000 4MB AGP	165

DIAMOND

Fire GL 1000 4MB PCI	**(179)*
Fire GL 1000 8MB PCI oem	**(235)*
Monster Stealth 3D 4MB PCI oem / reg	165/189
Stealth 3D 2000XL 4MB PCI	**(99)*
Stealth 3D 3000XL 4MB PCI VRAM oem / reg	165/185
Stealth 2500 DRAM PCI w. 1MB / 2MB	45/59
Stealth Video 64 2MB VRAM PCI oem / reg	109/*(139)
Viper V330 4MB AGP oem	**(175) 185*

HERCULES

Dynamite 128 PCI 4MB SMDRAM oem	**(109)*
Stingray 128 3D 8MB EDO oem	**(249)*

IMS

TwinTurbo 128P PCI VRAM w. 2MB / 4MB	195/265
TwinTurbo 128P PCI VRAM 8MB	395

LEADTEK

Winfast 3D L2300 8MB PCI	229
Winfast 3D L2300 8MB AGP	249

> " Central Computers has the latest products at the BEST PRICES. I come all the way from Oakland just to shop with their friendly and knowledgeable people. "
>
> *– Jose Rodriguerz, MIS Director*
>
> American Baptist Homes of the West

MATROX

Millennium II PCI 4MB oem	175
Millennium II PCI 4MB reg.	**(179) 195*
Millennium II PCI 8MB oem / reg	**(255/285)*
Mystique 220 PCI w. 2MB / 4MB	119/145
Rainbow Runner (for Mystique)	195
Memory Upgrade (Millennium II): - 4MB / 8MB / 12MB	129/195/279

NUMBER NINE

Imagine 128 Series II 4MB EDO PCI	**(189)*
Revolution 3D 128-bit PCI w. 4MB / 8MB	289/369
Revolution 3D 128-bit AGP 4MB oem / reg	239/289
Revolution 3D 128-bit AGP 8MB oem / reg	309/369
- 4MB Memory Upgrade (for Revolution)	159

SPIDER

Tarantula 64 MK II 2MB VRAM PCI	95

OTHERS

Boca Voyage Movie Player Accelerator VGA	285
Canopus Pure 3D 6MB	189
InterGraph Intense 3D Voodoo 6MB	225
Movie Plus 1100 MPEG Decoder	199
Televiewer / Televiewer Plus	89/145
Trident 8900 1MB ISA	45
Trident 9680 1MB PCI	39
Tvator Pro PC/MAC VGA to NTSC Scan Converter	119
Tvator Remote Pro VGA to NTSC Scan Converter	289
V-Mate Pro (video encorder : PC to TV)	189

Conferencing & Video:

AGFA: Ephoto 307 Digital Camera	**(295)*
Casio QV-100 640 x 480 Camera	599
Epson Photo PC Color Digital Camera	245
Epson Photo PC-500 Color Digital Camera	359
- w. PhotoPix LCD Monitor	**(475)*
Epson Photo Pix LCD Monitor	175
Howard Video Camera	295
Intel Smart Video Recorder III	189
Internet Videophone + Video Capture	135
Kodak DC20 Digital Camera	**(175)*
Kodak DC25 Digital Camera	**(275)*
Kodak DC50 Digital Camera Zoom Lens	**(475)*
Kodak DC300 Video Camera USB Port	169
Quick Cam for Win / Quick Cam Color	99/225
Sony Mavica MVCFD-5 Digital Camera	489
Sony Mavica MVCFD-7 w. Zoom	685
Snappy 2.0 (video Snapshot)	195
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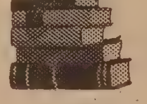

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32-bit Computing

continued from page 76

Without chipsets that support higher bus speeds and faster RAM, and given the current 33MHz PCI bus standard, system boards and adapter makers have been reluctant to violate Intel specifications. This, even though tests show that, except for regular Pentiums, higher system bus speeds of up to 100MHz improve performance significantly and can be sustained throughout the system without problems (some PCI adapters balk at >33MHz PCI bus rates, though some from leading manufacturers seem OK). But given the circumstances mentioned at the beginning of this article, pressures have been mounting to free the bus from this limitation, with the competition forcing Intel to address it too.

> **The real choice** for users interested in maximizing performance is between Intel's more expensive "Deschutes"+BX Slot I system boards and K6/M2+chipset supporting 100MHz bus speed and SDRAM, **neither of which are yet available.** The Pentium Pro and PII are transitional CPUs.

Getting On The Right Bus

The PII CPU was designed for the 66MHz bus speed. So also was the new Intel chipset for Slot I PII system boards, the 440LX (it replaces the older 440FX). Because the PII will not benefit as much from the higher bus speeds as regular Pentiums do (the L2 cache is not tied to bus speed), it seems that Intel won't change that. The only significant additions to the LX chipset seem to be AGP and SDRAM support (more of that in future articles).

On the other hand, to compete with Intel, AMD and Cyrix had higher bus speeds in mind. Tests have shown that 233MHz and 250MHz K6s gain 10% in performance and can reach PII levels of performance at 100MHz bus speed, at significantly less cost than PII systems. The problem has been the lack of chipsets supporting these CPUs and the faster bus speeds and RAM.

That seems to have been one Intel objective in moving away from Socket 7 technology to the proprietary Slot I. The first Intel CPU and chipset to support 100MHz bus speed will be the forthcoming "Deschutes" and BX, respectively, which are for Slot I boards only. In other words, system boards made for Intel CPUs and using Intel chipsets will no longer support non-Intel CPUs, as Socket 7 boards do.

Two chipset manufacturers, VIA and SiS, have been working on chipsets for Socket 7 boards which support higher bus speeds, the K6 and M2 CPUs, SDRAM, AGP and so on. The SiS 5571 chipset supports the M2 at 75MHz bus speed and keeps the PCI bus speed at the standard 33MHz rate. A forthcoming VP4 chipset from VIA is rumored to support 100MHz bus speed, but a split is said to have occurred between VIA and AMD, living the status of K6 support uncertain.

System board makers prefer to stick to the older Intel chipsets, trading off performance and lower prices for less risk. At the 75MHz bus speed supported by Cyrix, the PCI bus speed is 37.5MHz and non-standard. While Intel warns against such implementations, tests show that this modest increase of the bus speed improves performance without significant problems. It is not, however, the maximum desirable and possible.

So the real choice for users interested in maximizing performance is between Intel's more expensive "Deschutes"+BX Slot I system boards and K6/M2+chipset supporting 100MHz bus speed and SDRAM, neither of which are yet available. The Pentium Pro and PII are transitional CPUs.

If you already have a Pentium Pro (Socket 8) system, you will have to buy a new system board to upgrade. But if your current Socket 7 board supports the higher bus speeds and appropriate voltages for the K6 or M2, as well as other certain important features, you will also have the option to upgrade your Pentium to the fastest K6 or M2 you can afford to wait and pay for—an additional and significant incentive to go for Intel's competition, if they get you on the right bus. (Waiting may also get you improved MMX performance)

As to the desirable system board features, stay tuned. ■

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RESOURCES:

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- Archtek 33.6K V.34 Internal Fax/Modem w/ Voice
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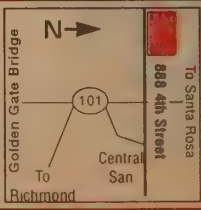

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CPD-200SX 17" 1280x1024 .25 NI, 60Hz, PnP	620
20SEII 20" 1600x1200 .25 NI	1750
CPD-300SFT 20" 1280x1024 .30, 80Hz	1390

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Toshiba XM-6102B 24X IDE Int.	85
ESS 16 IDE Sound Card	20
Yamaha YST-M7 (5W) / YST-M15 (10W)	40/66
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Adaptec 2940UW Ultra Wide- SCSI PCI w/ Kit OEM	215
ASUS SC200 SCSI-2 PCI w/ NCR chips)	67
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Promise ISA EIDE Controller	29

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Quantum QM33240ST-A 3.2GB IDE	225
Quantum QM34320ST-A 4GB IDE	260
Quantum QM36480ST-A 6.4GB, IDE	365
Atlas-2 2275S 2.1GB UW SCSI	360
Atlas-2 4550W 4.3GB UW SCSI	620
Seagate ST-32120A 2.1GB 12.5ms 128K IDE	170
Seagate ST-32272W 2.2GB Ultra-Wide SCSI 9ms	430
Seagate ST-34572W 4.5GB Ultra-Wide SCSI 9ms	640
Seagate ST-34501W 4.5GB UW SCSI	730
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Toshiba 1.4GB 2.5" IDE (for Notebook)	195
Toshiba 2GB 2.5" IDE (for Notebook)	255
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WD-33200 3.2GB IDE	215
WD-AC34300 4.3GB IDE	265
WD-AC35100 5.1GB IDE	335
WD-E4360 4.3GB Ultra-Wide SCSI	645
WD 6.4GB Ultra DMA	360

MODEMS

Sportster v.34 33.6K Int Fax/Modem	85
Sportster v.34 33.6K Int Fax/Modem w/ Voice & Speaker Phone	100
Sportster 56K Internal OEM/ w/ Voice	145/165
Sportster 56K Internal Retail/ w/ Voice	185/195
Sportster 56K External Retail/ w/ Voice	185/215
Archtek 33.6K Internal Modem w/ Voice	50
Archtek 33.6K Internal Modem w/ Voice & Speaker Phone	60
Smartlink X2 Compatible 56 Internal Fax/Modem w/Voice	90
PCMCIA 33.6K Fax Modem	95

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ASUS (w/o CPU)

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P2L97S ATX 440LX Chipset w/ SCSI	280
P2L97DS ATX 440LX, Dual, w/ SCSI	435
P55T2P4 586-200, PCI, 512K, Burst SRAM	155
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P65UP5 Pro 200MHz, Dual Pentium® Slots	545
TX97 512K, w/ 3 DIMM Socket AT	165
TX97E 512K, 4 SIMM/2Dimm AT	170
TX97X 512K w/3 DIMM ATX	170
TX97-XE 512K w/4 SIMM/2 DIMM ATX	170
TX97-XV 512K w/4 SIMM /2 DIMM ATX	210
Intel Portland 440FX P2 M/B w/Sound	205
Intel Atlanta 440LX P2 M/B w/AGP	255
QDI P51430TX w/ 512k Cache at Mainboard	110
QDI P51430TX w/ 512k Cache ATX Mainboard	125
AIR P6-LDX-SCSI, Dual Pentium® II, 440 LX AGP, SCSI, UIDE ATX	475
AIR P6-LDX-U-IDE, Dual Pentium® II, 440 LX AGP, UIDE, ATX	365
AIR P6-LXI-SCSI, Single Pentium® II, 440LX AGP, SCSI, UIDE, ATX	325
AIR P6-LXI-IDE, Single Pentium® II, 440LX AGP, UIDE, ATX	215
AIR P5-TXI-SCSI, Single Pentium®, 430TX 512K, ATX, SCSI	245
AIR P5-TXI-IDE, Single Pentium®, 430TX, 512K, ATX	130
AIR P5-TXA-IDE, Single Pentium®, 430TX, 512K, AT	115

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Baby Desktop AT Case w/ 230W PS	30
Mini AT Tower Case w/ 230W PS	30
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NETWORK

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3COM 3C589 PCMCIA RJ45 PNC Combo	145
3COM 3C589 PCMCIA RJ45	115
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Lanpro ISA Combo	22
Lanpro EN9120TX 10/100TX PCI card	42
Lanpro HUB: 5 Port (5TP)	50
Lanpro HUB: 9 Port (8TP + BNC)	75
Lanpro HUB: 16 Port (16TP + BNC) Desktop	135

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ATi 3D Expression PC2TV w/2M SDRAM	75
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Diamond Stealth 3D 3400XL 4MB VRAM OEM/Reg	165/195
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Diamond Stealth Video 64 2MB VRAM PCI, Upgradable	100
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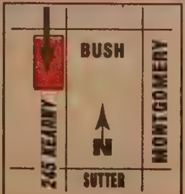

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BY AUREN HOFFMAN

Interviews The New-Fashioned Way

See No Evil, Hear No Evil

Auren Hoffman is the president of BridgePath (http://www.bridgepath.com)—an Internet recruiting firm for college students and recent graduates. He files this cautionary tale of technology that isn't quite ready yet based on a recent work experience.—eds.

Blurry vision; weird blotches on my face; people moving at ten frames a second; and no peripheral vision. Is this some terrible disease? Some crazy acid trip? No. It's videoconferencing over the Internet.

I could barely make out the receding hairline of the person I was interviewing. After coming into focus he accidentally tipped over the camera and was lost. Well, not exactly. I could still hear his muffled voice on my crackling speakers.

I used BridgePath, a recruiting company I work at, to find the perfect sales guy. He sent me a stellar resume and an impressive list of references His cover letter was well-written and he even had a home page (which looked quite good). But Mr. X was in Austin—quite a ways away from the BridgePath office in the San Francisco Bay Area. It was only a first-round interview—hardly big enough to justify the expense of flying him to California. So I emailed him and requested that we do an initial phone interview.

Mr. X is an impressive guy—but he wanted to impress me even more. He suggested that we do a video interview over the Internet using Microsoft's NetMeeting. He overcame my skepticism, and we set up a thirty-minute meeting.

It Seemed Like A Good Idea At The Time...

Thirty minutes? What was I thinking?

Of course, there were technical problems. Mr. X could not find me. It happens all the time that an interviewee gets stuck in a strange city looking for the right building. But Mr. X was lost on the information superhighway.

It turns out that Mr. X entered my IP address wrong. Then, just as he fixed it, his computer crashed. Finally, after my coaching him on the phone, Mr. X and I were finally connected on NetMeeting, attempting to conduct a normal interview.

> All I could look at was myself. You know the saying that **TV cameras add 15 lbs?** Well, computer cams make you unbearably skinny! **And ugly!** Plus, because of the lighting in the room, I had a **weird blotch** on my head.

I set up a dual-screen—one that shows Mr. X, one that depicts me. But all I could look at was myself. You know the saying that TV cameras adds 15 lbs? Well, computer cams make you unbearably skinny! And ugly! Plus, because of the lighting in the room, I had a weird blotch on my head.

The interview seemed like it was being conducted under a strobe light. Even though Mr. X was on an ISDN line (and me on my trusty T1), the interview looked more like a string of pictures haphazardly put together than video. I doubt we ever surpassed 10 frames a second. Mr. X could be sitting still for a while and then move slightly, and it would totally throw me off. I would start to worry that he had run away and then, all of a sudden, he'd be back into view.

The static is what killed me.

Though Microsoft NetMeeting is a great product and is very easy to use, the video and audio capture had its flaws. Static video, garbled words—it just goes to show you that Internet communication still doesn't beat the real thing.

With the blotch on my head, the strobe light, and the static on the line—the interview was like Mikhail Gorbachev meets Cheech and Chong (and the trio singing "Lucy in the Sky with Diamonds").

Probably Not Ready For Prime Time

Needless to say, the interview was a disaster. Here was some super-skinny guy with a blotch on his head asking garbled questions in an interview that was supposed to last thirty minutes but ran for 106 (but who's counting?). I could not get my points across the Internet and he could not answer questions he could not comprehend. Twice, I actually typed my questions in the NetMeeting chat window.

In the end, Mr. X took another sales job and sent me a polite card telling me he was pleased with the interview experiment. But it left a bad taste in my mouth. From now on, when I can't interview in person, I'm sticking to the telephone. ■

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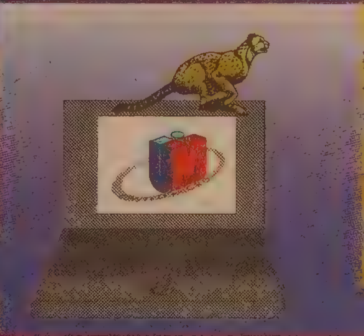

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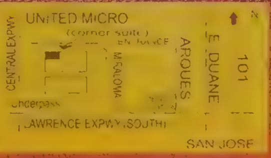

BY ROYAL P. FARROS

The Making Of An Internet Startup—Part XIV

Venture In The Valley, Continued

Venture capital in the Valley is so big these days, it needs its own series of articles just to cover the basics.

We last left our discussion talking about one of the big differences between raising money today and just a few years ago: A viable alternative called Angels. And while no self-respecting venture capitalist would admit it, the sophistication and deep pockets of today's Angel investors are causing a devil of a time for traditional venture firms.

So what really are the differences?

Angels have taken over the "seed" role that certain venture firms have played in the past. Angels are more approachable, require less due diligence, and expect less experience, which makes Angels a great match for the young, raw entrepreneur.

Don't feel sorry for the venture industry: Venture capitalists have adapted quite nicely to their new investing station in life. To be quite honest, so much money is pouring into venture funds that most can't spend (waste?) their time on investments smaller than $1.5 million.

It comes down to simple mathematics: A medium-sized venture fund is $75 million and has three general partners. Each partner is expected to invest $25 million. Well, actually, each partner is expected to invest $12.5 million... smart venture funds expect to put in at least twice the amount of the original investment into a deal. An average general partner can responsibly manage five or six investments, which means that whether a venture capitalist likes it or not, the target investment size of each deal has to be $2-$2.5 million.

Sure, there are some ways to invest less. If a venture capitalist "leads" a deal, this means they'll have a board seat and assume major responsibility for "steering" the entrepreneurs. It also means they put in most of the money. There can only be one lead, however. Everyone else who invests are called the "co-investors," and co-investors, for all intents and purposes, are less active, often not even taking a seat on the board... often not even attending board meetings as a guest after the first few! In this situation, you'll see established venture funds appropriately take a smaller piece of the investment commensurate with their reduced participation.

Who's better? This isn't the right question to ask. The right question is, "Who's better for you?" In general, if you've got experience, go the venture route. Sure it's more structured, but if you're experienced, you'll understand the necessity of that structure. If you're just your basic entrepreneur with a lot of enthusiasm but little cash, an Angel is just the ticket.

> ***While no self-respecting venture capitalist would admit it,*** the sophistication and deep pockets of today's Angel investors are causing a devil of a time for traditional venture firms.

Changing Of The Guard

Like entrepreneurs springing forth from successful high-tech companies, venture capitalists are leaving the safety and security of larger, more established funds to do their own entrepreneurial venture startups. Armed with just a track record, new funds are popping up like roadside weeds.

New funds share almost as much in common with the Angel community as they do traditional venture firms. A partner that has a great track record is still not the same thing as a *firm* with a great track record. You'll hear established venture folks expound on the importance of this: "Our fund will open doors for you. Our fund will have the cachet to help you recruit top people. Our fund will give your effort credibility, especially when it comes to raising another round or going public."

All good points. However, you'll hear new funds rebut: "Our fund will *work* for you... if you don't succeed, then we don't succeed and won't be able to raise another fund. We're more hungry. You're more important to us." Nice rebut.

Who's Better?

At T/Maker in 1989, we were lucky enough to have both an established and a new fund interested in investing. We ended up choosing the new fund for a variety of reasons, but maybe the biggest was that it just felt right.

It turned out to be a pretty good choice: T/Maker was the very first venture investment of this new, little $35 million fund called Hummer Winblad. (Thank you Ann and John!) Those people that follow venture goings-on know that in eight short years, Hummer Winblad has soared to the top of the pile and is generally considered one of the

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The Making Of An Internet Startup *continued...*

top venture firms *in the world.* Yes, it was really nice to have *that* kind of momentum behind us at T/Maker.

At iPrint, we've decided to "have our cake and eat it, too," something we couldn't do in 1989. What I mean is that our lead investor will be a brand-new fund, but we'll also choose an established fund as a co-investor. Of course, it helps when you're raising four times as much money because it's easier to spread out the investment.

Again, there's no right or wrong way to approach this, just what feels good to you. And this feels great to us. Since we're in the midst of contract negotiations, I can't really say who all the players are, but I'll update everyone as soon as I can.

Angels have taken over the "seed" role that certain venture firms have played in the past. Angels are more approachable, require less due diligence, and expect less experience, which makes Angels a great match for the young, raw entrepreneur.

How Important Is Any Of This?

Here's something you hear a lot: If you don't need to raise money, don't. As I wrote in a prior article, this advice is quickly becoming passé. Being able to quickly scale an organization for success is a major requirement in the Internet space. This only happens with money—and most of the time, quite a lot of money. "I create; therefore, I spend." Venture capital is now a time-proven and effective way of getting that "spending" money.

To Be Continued...

Egad, a three-parter! Venture capital is that important, isn't it? Next issue, we'll continue our discussion of venture in the Valley by talking terms, talking valuation, and talking how venture capital will change your company's life forever. ■

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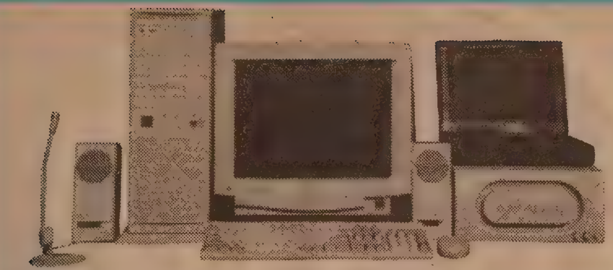

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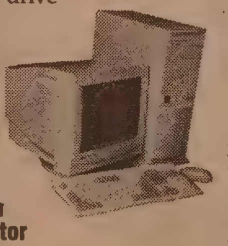

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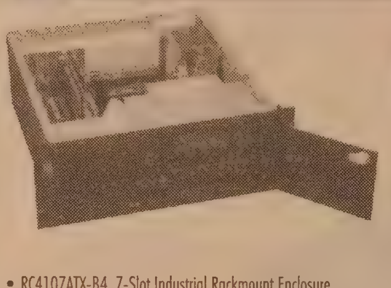

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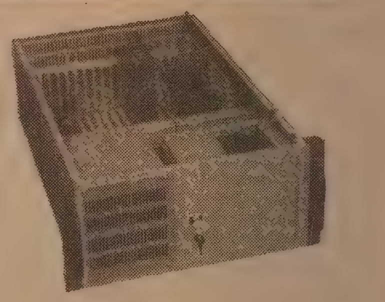

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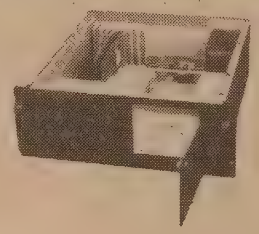
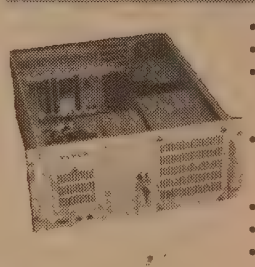
- (7″ H x 19″ W x 18.5″ D)
- Black Epoxy Powder-Coated Exterior Paint Finish
- Three 5.25″ Horizontal Front Accessible Drive Bays and Two 3.5″ Vertical Internal Drive Bays
- Locking, Dust-Proof Front Door with Black Keylock
- Low Noise, High MTBF Cooling Fans
- Intel ATX or Compatible Motherboard Mountable on Fixed Standoffs
- (Intel I/O Shields & ATX Power Supplies Also Available)

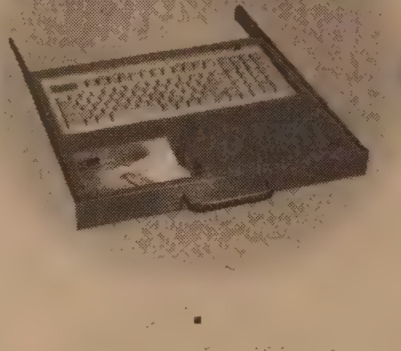


RC5107HAX/RC5108AT

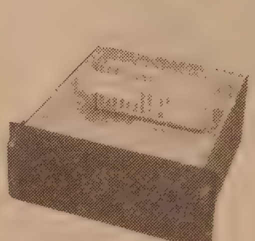


- 7 or 8-Slot Industrial Rackmount Enclosure
- (8.75″ H x 19″ W x 20″ D)
- White High-Baked Water Exterior Paint Finish (Also Available in Black Epoxy Powder-Coated Exterior Paint Finish)
- One 5.25″ Vertical Front Accessible Drive Bay, One 3.5″ Vertical Front Accessible Drive Bay, Three 3.5″ Vertical Internal Drive Bays
- Locking, Dust-Proof Front Door With Silver Keylock
- Low Noise, High MTBF Hot-Swappable Cooling Fans
- Baby-AT or 8-Slot Passive Backplane Mountable (RC5108AT); Intel ATX or Compatible Motherboard Mountable (RC5107HAX) on Fixed Standoffs
- 300W Hot Swappable, Redundant Power Supplies (Front Accessible)

19" RACKMOUNT KEYBOARD WITH MOUSE HOLDER



RC4108/RC4114



- 8 to 14-Slot Industrial Rackmount Enclosure
- (7″ H x 19″ W x 18.5″ D)
- Black Epoxy Power-Coated Exterior Paint Finish
- Three 5.25″ Horizontal Front Accessible Drive Bays and One 3.5″ Vertical Front Accessible Drive Bay
- Locking, Dust-Proof Front Door with Black Keylock
- Low Noise, High MTBF Cooling Fans
- Baby-AT or Full-Size Motherboard or 8-Slot Passive Backplane Mountable (RC4108); 14-Slot Passive Backplane Mountable (RC4114) on Fixed Standoffs
- (AT & PS/2 Style Power Supplies Also Available)

RC5120QS

- 20-Slot Industrial Rackmount Enclosure
- (8.75″ H x 19″ W x 26″ D)
- Black Epoxy Powder-Coated Exterior Paint Finish
- Four 3.5″ Horizontal Front Accessible Drive Bays and Two 3.5″ Horizontal Internal Drive Bays, Two 3.5″ Vertical Internal Drive Bays
- Locking, Dust-Proof Front Door With Black Keylock
- Low Noise, High MTBF Cooling Fans-Five 39CFM Fans in Center
- 20-Slot Passive or Segmented Backplane Mountable on Fixed standoffs
- 300W Hot Swappable, Redundant Power Supplies (Front Accessible)

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1515 Industrial Way, Belmont, CA 94002

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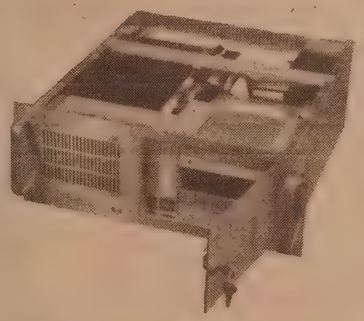
- ***Design to pass FCC class A or B, UL, CE certifications***
- ***Improve EMI performance***
- ***Superior cooling effects by optimal air-flow design***
- ***Reduce fan noise level within the enclosure***
- ***Better electrical grounding***
- ***No overspray or painting inside***
- ***No rough edges (safer handling)***
- ***Durable epoxy powder-coated paint***
- ***Easier replacement of air filter and fans***

High-Performance Rackmount PC Products for Industrial, Computer Telephony, Semiconductor & Telecommunications

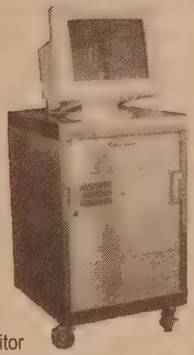
STAINLESS STEEL RACKMOUNT SYSTEM

- RC4114SS, 14-Slot Industrial Rackmount Enclosure
- (7" H x 1 9" W x 18.5" D)
- Electro-galvanized Steel (Zinc Plated) Body with Stainless Steel Front Panel
- Three 5.25" Horizontal Front Accessible Drive Bays, One 3.5" Vertical Front Accessible Drive Bay
- Pentium 166MHz CPU Card (Intel Triton-Chipset, 256K Pipeline Burst Cache)
- Pentium 166MHz CPU with CPU Cooling Fan
- 14-Slot PCI/ISA Passive Backplane
- 32MB EDO Memory
- Teac 1.44MB 3.5" Floppy Drive
- Western Digital 2.1GB SCSI Hard Drive
- Toshiba 12X SCSI CD-ROM
- Adaptec 2940 SCSI Controller
- Diamond Stealth 64bit 2MB VGA Card
- Microsoft Windows NT 4.0 Workstation
- 300W PS/2 Power Supply
- 19" Stainless Steel Rackmount Keyboard with MS Mouse
- Class 1 or 10 Cleanroom Applications



STAINLESS STEEL RACK CABINET

- 36" Stainless Steel Industrial Rack Cabinet
- (36"H X 21"W X 24"D)
- Stainless Steel Construction
- 1U Height Stainless Steel Rackmount Keyboard
- Up to Three 4U Height Rackmount Enclosure or Two 5U Height Rackmount Enclosure Mountable
- For Class 1 or 10 Cleanroom Applications
- (48" and 60" Rack Cabinets Also Available)



Shown with Optional Monitor

PENTIUM PRO PCI/ISA CPU CARD WITH FLAT-PANEL/SVGA & ULTRA- WIDE SCSI

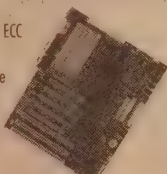
- SM-P6IPVS, Pentium Pro™ Processor 75MHz - 200MHz
- CPU Built-in 256KB Cache
- Intel® 82440 FX Natoma PCI Chipset
- Up to 128MB, EDO and ECC Support
- 256KB Award Flash BIOS
- On-Board C & T 65550 High Performance PCI Flat Panel/CRT Controller
- On-board 1MB Video Dram, Expandable to 2MB
- On-board Adaptec AIC-7880 Ultra-wide SCSI Controller

PENTIUM PCI/ISA CPU CARD WITH FLAT-PANEL/SVGA

- SM-P5IPV, Pentium™ Processor 75MHz - 200MHz
- 256KB Pipelined Burst Cache, Upgradable to 512KB
- Intel® 82430 VX PCI Chipset
- Up to 128MB, EDO and ECC Support
- 128KB Award Flash BIOS
- On-Board C & T 65550 High Performance PCI Flat Panel/CRT Controller
- On-Board 1MB Video Dram, Expandable to 2MB

PCI/ISA MAINBOARD FOR PENTIUM II PROCESSOR (ECS)

- P6KFX-A, Single Pentium™ II 150 - 266MHz Mainboard
- Intel® 82440FX Chipset
- Flash Eeprom, Support Plug and Play 1.0A, APM 1.2, MultiBoot, DMI
- 256K/512K Cache Build-in CPU or CPU Card
- Up to 384MB Memory, EDO and ECC Support
- 3 ISA Slots, 5 PCI Slots (with One ZSA/PCI Shared Slot)
- Full ATX with Dual Height I/O Stack, 4 Layers



PCI/ISA DUAL PENTIUM PRO MAINBOARD (ECS)

- P6FX2-A, Dual Pentium Pro™ 150 - 200MHz Mainboard
- Intel® 82440FX Chipset
- 256KB or 512KB Cache
- Up to 512MB Memory, EDO and ECC Support
- 3 ISA Slots, 4 PCI Slots (Including one Shared)
- ATX Single Height, 6 Layers

INTRANETWARE™ Server Series

Fast-Switching Rack-Mount Server

The RMNT-FX1a is a Pentium Pro™ based System designed to meet the challenges of today's performance-based server operating systems such as Novell's Enterprise Solutions. Among its unique features are:

- Designed for MIS data center operation
- Rack mount with face plate at front for easy cable management
- 10/100 autosensing, 4 segments auto switching with aggregate throughput of 400Mps (800 Duplex).
- Plug and play to Ethernet LAN with instant bandwidth increase 4 fold with no change to current equipment or cabling
- RAID-5 and SFF III ready.
- Pentium Pro 200. 64MB memory upgradable to 256MB.
- 8 Gigabyte Wide SCSI drive.
- ECS motherboard P6F x 1-A inside.
- Novell Tested and Approved.

In addition to the above, the rack-mountable RMNT_FX1a system includes several state-of-the art features as well. It utilizes the intel 440FX* PCI set chipset as its core logic, a 1MB Award Flash BIOS with support for PnP 1.0A,APM 1.2, Multiboot and DMI, one EPP/ECP mode parallel port, two 16550 high speed serial I/O port, and built-in USB headers for future upgrades.

Chassis
- Rack Mount (ATX Platform)
- 16.813" x 18.88" x 6.75" (W xD x H)
- Five 3.5" drive bays (one exposed)
- One 5.25" drive bay (exposed)

Certifications
- FCC Class B for the system
- Novell 4.1, with approved options

Warranty
- Two-year parts and labor standard
- Optional on-site warranty available

Options
- Video monitor 14, 15 or 17" Mounting Rack
- Choice of Novell Intranetware 4.11, 3.xx or Windows NT
- Webserver (for Intanetware) option
- Tape drive

Shown with Optional Monitor

Yes NetWare.

PCI

energy EPA POLLUTION PREVENTER

intel.

USB

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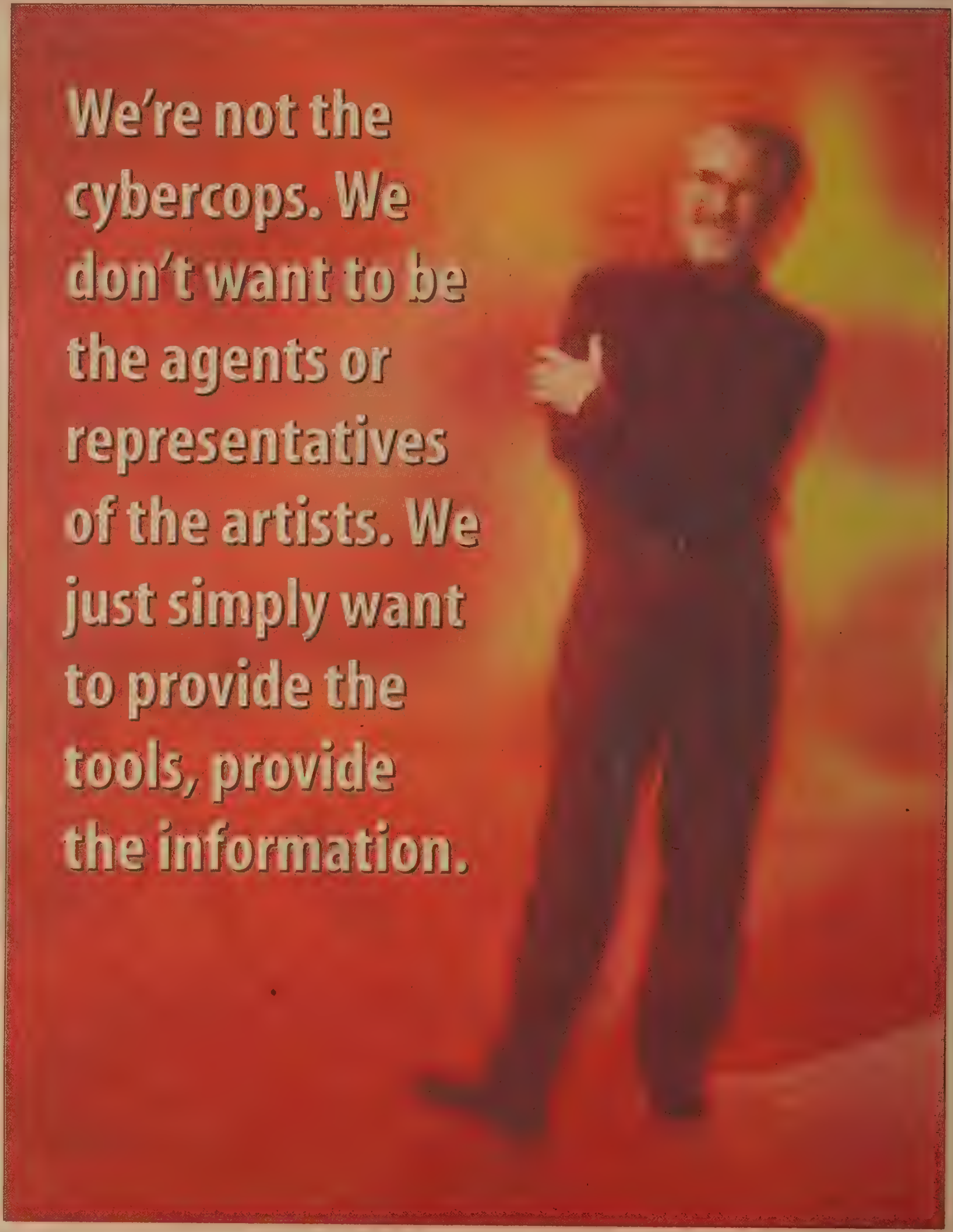
Your One-Stop Source for Industrial Computer Needs

Digital Watermarks

continued from page 98



We're not the cybercops. We don't want to be the agents or representatives of the artists. We just simply want to provide the tools, provide the information.

With the explosive growth of Web-based commerce, artists and photographers have not been slow to recognize the potential for reaching a much larger audience than they'd been able to reach in the analog world. However, many have been loath to adopt the technology—some, for example, have been advised by their attorneys that making their images available online makes it far more difficult to defend their copyright, and most recognize the underlying assumption on the part of many Netizens that if something's downloadable, it must be free and in the public domain.

"What most people don't realize," says Larry Logan, director of creative marketing at Digimarc, "is that most infringement is inadvertent—estimates are that up to 80% is inadvertent. Our whole approach when we started the company was to provide a mechanism where the concept of inadvertent infringement would really go away.

"At no cost, and in less than a minute, the person who is in physical possession of the image can find out who created it and is distributing it, and be on the telephone to that person. All you have to do is ask the image, and the image will tell you all about itself."

Logan himself is a veteran photographer, having worked for publications including *Sports Illustrated*, *National Geographic* and *Look* while still in college. More recently, before joining Digimarc, he worked for a decade as creative director at *Playboy* and as Hugh Hefner's personal photographer.

In addition to large customers like *Playboy*, 20th Century Fox, and Chrysler Corp., Digimarc's client list includes a host of photographers, ISPs, Web designers, and stock photo agencies. At October's Seybold conference, we spent some time with Logan learning about the company, its technology, and its potential applications in managing intellectual property.

* * * * *

Given your history with *Playboy*, were you involved in their becoming a Digimarc customer?

As it turns out, no. Ultimately we would certainly have approached them as we moved more into publishing clients, but as it turns out there was someone in Portland who was aware of us, saw Christie Hefner at a conference in Phoenix, and said "You've got to do this. Call these people." One hour later the call came from Chicago and we were on our way.

So how does this work? How are they using the technology?

They're using it initially to protect images on their Web site. They have over a million hits a day, and they are subject to an extraordinary amount of infringement and reproduction of their images. They're only just now in the phase of starting to watermark those images so they can track them.

They've had a couple of very large cases where they've gone after infringers. One that's been written up in a number of papers is somewhere in San Diego. The images were being taken, and people changed the file names, so that it's hard to discover what the images were—whereas watermarks wouldn't be so susceptible to throwing people off the chase in that way.

Playboy is similar to many large publishing and entertainment firms as they move onto the Internet, as to how they protect and track their visual assets—because that's the business they're in. It's a crucial thing. The most advanced technology to do it is with a watermark, because we also have a means to track usage on the Web, and see where those images are being reproduced.

In the case of our MarcSpider service, we can go find those images on the Web and give those as a report to a Digimarc subscriber, showing the location of their images. And it's hotlinked, so that with just one click, they can go right to that site.

Say I'm a photographer—I've heard about your technology, but I don't know very much about it.

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HOLIDAY SPECIAL

- **Pentium® Chip-Based PCI Motherboard**
- **512K Pipeline Burst Cache**
- Intel™ Triton VX Chipset
- 16MB EDO RAM exp. to 128MB (72-pin)
- 1.2GB Hard Drive
- Diamond Stealth 64 PCI Video w/2MB
- Built-in IDE/IO Controller (16550)
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- 104 Key Windows 95 Keyboard
- Mouse w/Pad
- Over 500 Titles Value CD

P5-233	**$1040**	**P5-200**	**820**
P5-166MMX	**835**	**P5-200MMX**	**940**

SUPER POWER MULTIMEDIA

- 32MB EDO RAM
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- 24X CD-ROM
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- Diamond Stealth 3D 4MB SGRAM
- 16-Bit Sound Card
- Speakers 240W
- 1.44MB 3.5" Floppy Drive
- Mid-Tower Case with Power Supply
- Keytronics Keyboard for Windows 95
- Microsoft Mouse with Pad
- Free CD Deluxe Pack

Pentium® II-300 Intel Atlanta ATX	**$1900**
Pentium® II-266 Intel Portland ATX	**$1640**
Pentium® II-233 Intel Portland ATX	**1550**
Pentium® Pro-200 Intel Venus ATX	**1500**

DREAM MULTIMEDIA

- **Pentium® Chip-Based Intel™ Tucson Motherboard**
- **512K Pipeline Burst Cache**
- Intel™ Pentium® Processor w/heatsink & fan
- 16MB EDO 60ns Memory
- **1.2GB EIDE Hard Drive**
- 2MB PCI SVGA Card
- **24X Toshiba CD-ROM**
- 16-Bit SoundBlaster
- 240-Watt Stereo Speakers
- 1.44 Floppy Drive
- ATX Medium Tower Case w/250W PS
- MS Mouse
- Windows 95 Keyboard
- Over 500 Titles Value CD

P5-166 Tucson	**$750**	**P5-200 Tucson**	**730**
P5-166MMX Tucson	**750**	**P5-200MMX Tucson**	**850**

DELUXE MULTIMEDIA

- **512K Cache**
- **8MB RAM**
- **1.2GB Fast IDE Hard Drive, WD**
- PCI IDE with I/O
- PCI SVGA Card w/1MB
- **24X Toshiba CD-ROM**
- 16-Bit Sound Card & Speakers
- 1.44MB 3.5" Floppy Drive
- 14" SVGA .28 Non-Int. Color Monitor
- Mini Case with 230W PS
- FCC 104 Keyboard
- Mouse with Pad
- Over 500 Titles Value CD

P5-233	**$935**	**P5-200**	**720**
P5-166MMX	**730**	**P5-200MMX**	**830**

VALUE SYSTEM

- **Pentium® Chip-Based Intel™ PCI Motherboard**
- **512K Pipeline Burst Cache**
- **Intel™ Triton Chipset**
- **8MB RAM**
- **1.2GB 10ms IDE Hard Drive**
- 1.44MB 3.5" Floppy Drive
- Built-in IDE/IO Controller (16550)
- PCI SVGA Card w/1MB, 64 Bit
- **14" SVGA .28 Non-Int Color Monitor**
- Mini Case with 230W PS
- FCC 101 Keyboard
- Mouse with Pad

P5-233	**$810**	**P5-200**	**600**
P5-166MMX	**610**	**P5-200MMX**	**720**

★ SUPER SALE ★

Monitor Mirror/Microphone	**$6/6**
Sony 15" 100SX .25 Retail Pkg.	**300**
Floppy Diskette	**22¢**
HP Ink Cartridge 500/600/800 Series	**16/16/18**
HP 890C Printer	**430**
HP 6Lse Printer	**355**
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HP 672C Printer	**190**

SOFTWARE (W/SYSTEM PURCHASE)

Windows 95 Full Copy CD Version	$80
Dos 6.x	30
Office Professional 97 CD Version	190
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Windows for Workgroups	48
Windows NT 4.0 Server CD	480
Windows NT 4.0 Workstation CD	180

MOTHERBOARD w/o CPU

Intel™ Atlanta w/Sound	$230
Intel™ Venus Pentium® Motherboard w/Sound	145
Intel™ Tucson Pentium® Motherboard Triton II w/Sound	178
Pentium® Motherboard w/512K IDE/IO Supports Regular CPU and New MMX CPU	77
New Pentium® Motherboard supports 90-266MHz	99

MEMORY/CACHE

2x32 60ns, 72-pin, 8MB/EDO	$29
4x32 60ns, 72-pin, 16MB EDO	49
8x32 60ns, 72-pin, 32MB EDO	98
256K Pipeline Burst	10
512K Pipeline Burst	15

CPUs

Intel™ (with M/B Purchase)

Intel™ P5-200	$140
Intel™ P5-166MMX	CALL
Intel™ P5-200MMX	CALL
Intel™ Pro-200	CALL

CASE & POWER SUPPLY

ATX Case w/250W PS Dig.	$56
Mini Tower Case w/230W PS Dig	23
Mid Tower Case w/250W PS Dig	37
Full Tower Case w/250W Dig	49
250W Power	19

FLOPPY DRIVE

1.44 MB	$18

MOUSES

3-Button/Microsoft	$5/19

HARD DRIVES

1.6GB IDE	$120
2.1GB DE	150
2.7GB IDE	160
3.1GB IDE WD	195
4.0GB IDE	247
2.0GB UW SCSI	288
4.3GB UW SCSI	750

KEYBOARDS

Keytronics 104-Enhanced Win 95	$16
MS Natural Keyboard	57
Mitsumi 104 Windows 95 Keyboard	10

TAPE BACKUPS

Colorado

DJ-25 3000 3.2GB	$165

VGA CARDS

S3 w/1MB Cirrus Logic	$24

Diamond

Stealth 64 PCI, 2MB DRAM Video 2001	$45
Stealth 3D 2MB DRAM	65
Stealth 64 PCI 2MB VRAM 3D	103
Stealth 3D 4MB VRAM	139

SPEAKERS

Deluxe Speakers	$5
100-Watt Stereo Speakers	13
240-Watt Stereo Speakers	26

CD-ROM/SOUND CARD

Sound Blaster Pro 16 PNP/64 AWE/ IDE Interface	$46/79
16-Bit Sound, Win 95, PnP	16
24X Toshiba CD-ROM Drive	77

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Eureka Pack Over 500 Titles CD Pack $30

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UPGRADING CHARGES

Labor charges are the following:

CPU & Memory Upgrade	FREE
System Diagnostic Checkup	$10
Multimedia Kit Installation	20
Installation for HDD	10
Video Card + Driver Setup	10
Install Motherboard	20
Install Floppy Drive	$10
Install New & Power Supply	10
Install Tape Drive	10
Install Fax/Modem	10
Install Software/Setup	25
System Troubleshooting	30

MONITORS

14" Super VGA 1024x768 .28, MGC	$160
15" SVGA/Dig 1280x1024 .28, MGC	225
17" SVGA/Dig Impression .27	425

NEC

Multisync 17+/P750	$633/815
Multisync 21 1100/XP 21 P1150	1200/1310

SONY

15" 100SX .25	**$300**
15100SF 15" 1280x1024 .25	335
17 200SX/17" 1280x1024 .25 SF	$570/620
300SFT 20" .30	1290

VIEWSONIC

15GS 15" 1280x1024 .28, 60Hz	$270
17GS 17" 1280x1024 .27	515
PT770 17" 1600x1280 .25	610
17PS 17" 1600x1280 .25 Green	615
G800 20" 1600x1280 .28	950
PT813 21" 1600x1280 .25	1320

Monitor viewable size may be smaller advertised size.

FAX MODEM

56K Fax Modem w/Voice Supra	$90

US Robotics

Sportster 56K w/Voice Int/Ext	145/175

Dealers Welcome

Terms & Conditions: Prices and availability subject to change without notice or obligation. Shipping, COD & insurance are extra and are not refundable. Prices reflect cash discount. All returns must have prior authorization. All returns must be in original packaging and complete. 15% restocking charge on returns after 3 days. Not responsible for typographical errors. Pentium® is a registered trademark of Intel Corporation.

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As a photographer, your professional success is tied to a yin and yang of attribution and compensation. If you lose attribution in those credit lines, you will not get that fair share of compensation. More compensation helps you market yourself and get more attribution, so they work together. But robbed of attribution, it'll stilt your professional success.

The challenge has always been that your images can become orphans, especially on the Web, just instantly—they are robbed of attribution. By putting a watermark on the image, there's two things you can accomplish.

One is sort of a protective aspect: to announce ownership and copyright, putting people on notice that they're handling your images. If they want those images there's a methodology in using a watermark to immediately know who owns the image and to contact that person.

The second component has to do with marketing: By putting a watermark on that image, I'm also putting a business card or an ad in that image. When just the raw image is found, within seconds the watermark can be easily read, you can have my phone number and my email to contact me for future assignments, or perhaps to license that image.

How do you get the watermark in? You have a photo, which maybe you have not taken digitally. You have it there on your flatbed scanner. What do you do to cause the watermark to be in there, and what *is* it exactly?

In order to embed a watermark, the image must be in digital form at one stage. Certainly if it's going to go on the Web, or in a magazine or newspaper, it will be digital at one point.

Once it's in digital form, the tools to embed a watermark are already readily available. In other words, you don't buy software from us; our tools are bundled in 90% of the digital imaging/editing software being shipped worldwide.

In the last nine months, since we first shipped with Photoshop, there's been an enormous adoption rate with Corel's products and Micrografx products, so if you buy practically any of the current professional tools, Digimarc's already there.

Then it's just a very simple procedure to log onto our site, get a professional subscription for $99, or a free subscription.

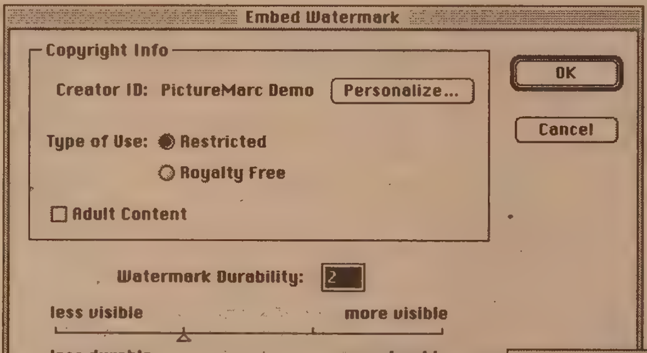
What we do is assign you a unique creator identification number, and you save that on your machine—

Kind of like your public encryption key?

Absolutely. And simply by using the filters or other tools in Photoshop, you apply a watermark.

What it does is create a small patch, roughly 125 x 125 pixels square, and it repeats that, tiling it throughout the image, back and forth from top to bottom.

The watermark is not something visible that you see, it is not English that you read. What we're really doing is gently raising or lowering the pixels by a very small amount that would be imperceptible to the eye—only in the brightness level, independent of file format.



Embed Watermark

Copyright Info

Creator ID: PictureMarc Demo

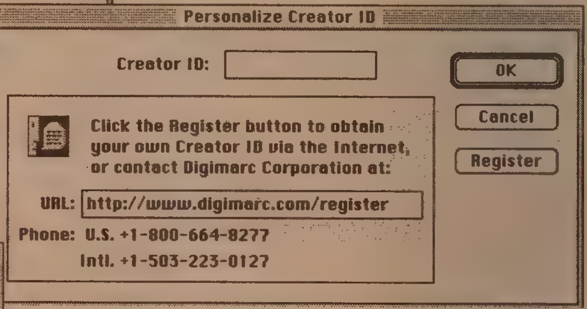
Type of Use: ● Restricted ○ Royalty Free

☐ Adult Content

Watermark Durability: 2

less visible — more visible

less durable — more durable



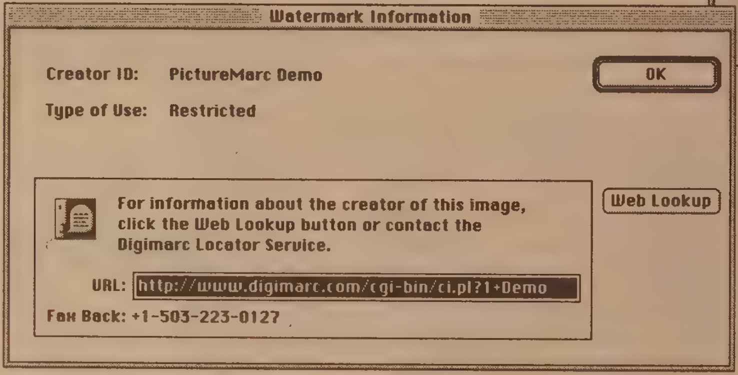
Personalize Creator ID

Creator ID:

Click the Register button to obtain your own Creator ID via the Internet, or contact Digimarc Corporation at:

URL: http://www.digimarc.com/register

Phone: U.S. +1-800-664-8277
Intl. +1-503-223-0127



Watermark Information

Creator ID: PictureMarc Demo

Type of Use: Restricted

For information about the creator of this image, click the Web Lookup button or contact the Digimarc Locator Service.

URL: http://www.digimarc.com/cgi-bin/ci.pl?1+Demo

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Above: Embedding a digital watermark with Digimarc; right: Registering a watermarked image via the Internet; below: Watermark info viewed from within Photoshop.

Doing it in a way that matches the information in the image—the software uses a process we call "perceptionally adaptive," where it reads the image and looks at the areas where it can hide at greater levels. If there's a solid color, say white, it might reduce its energy only in that portion, because any change in that solid monochromatic tone might be more perceptible to the eye.

There's a tremendous amount of research and algorithms, what the eye can see or not see, that has to do with how we hide the energy, the pattern. Even "pattern" is too strong a word—it's really kind of like noise. If you could magnify or enhance the watermark, it would be kind of like film grain—little bitty black dots.

What that patch is carrying is your unique creator ID, but there's also some other information it can carry. The serial number of the image, a transaction number of the image—perhaps that's the license that was sold to *Time Magazine*, and that's the specific transaction number, so that later if someone was using that image, you could trace the leak, and you could also point to the fact that the only time it had that specific serial number is on the image licensed to *Time*, and you don't have the rights to use it.

There are a few other flags—public notification that says "do not copy," or "for position only." Also, there's a power setting that lets the person using Photoshop control how much energy they want to put into the image, depending on whether it's going to print or out to the Web.

It just takes a couple of seconds to embed the information. Once it's in the image, it's buried throughout the image, and wherever that image travels, whether it's in digital form on the Web or in printed form, it's carrying that watermark.

At the other end, if you see that image—either scan it out of a magazine or pull it off the Web, or get it on a floppy—when you open that image in 90% of the imaging software, or using our free reader downloadable off our site, then you'll get a notification that the image contains a watermark.

Even when you scan the image?

Right. We survive print.

When you open the image, you see it has a watermark. You say, "Give me more information," and then you see the creator number.

We put in "do not copy" and other public things, and then by pushing a button, it will invoke your Web browser, run to find a page on the Web that has all the information about the image creator or distributor—say it's a stock agency or Time-Life reselling their images—so

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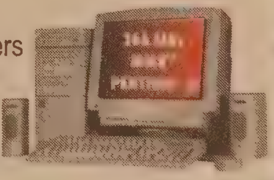

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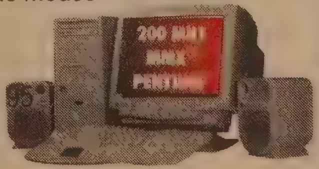

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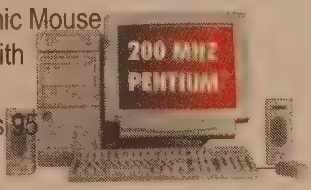

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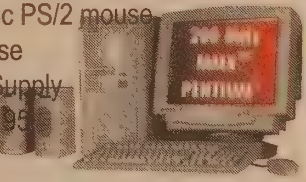

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in thirty seconds, with no cost to the person looking at the image, they can have all the robust information, about how to contact the person who's done the image.

I mentioned earlier that we were embedding just a unique creator ID number, with a few other little flags or attributes. Some people, when we first started out, said, "Well, if you can embed that, why don't you just go ahead and embed my name as the photographer, my phone number, maybe my address?"

Two problems with that. One is that the little bitty patch is kept small for security reasons—in case someone tries to steal a portion of your image, they're still taking watermarks. With all that additional information, the patch becomes very large, and therefore we lose some security.

There's also a more compelling reason simply to put a number—the number always serves as a pointer. It doesn't carry the actual information. The reason is, I'm a photographer. I watermark this image. Tomorrow I move. Tomorrow I change my phone number. When you get the image, you would be thwarted in trying to contact me because the trail would come up cold.

Because I can go to my page at Digimarc, and as a photographer can update my information in one minute, that pointer, embedded in the image, will always point to my most current contact information. I can embed an image now, and ten years from now if you go to read it again you'll get the most current contact information, and you'll be rewarded for having asked the image for information, and we can do some business.

So my images can work for me ten years from now, and help me to get licensing revenue. You're happy because you were able to make a clearance on the image, and you feel comfortable that I'm not going to find out about it and come after you. I'm happy because I was able to do commerce, where otherwise the trail would go cold and in essence I would have an orphan out there.

We use the phrase that we're trying to stop orphans. Another phrase we use is that we're trying to embed a persistent identity. We want to give an identity to that image, wherever it travels, for whatever length of time.

So how did all this come into being?

Geoffrey Rhoads, our brilliant founder and astrophysicist, was working on a project having to do with deep-space imaging. Geoff was trying to figure out how, on Earth, to photograph these deep space constellations, novas, whatever, with the same clarity that one would get using the Hubble telescope

continued on page 110

Under The Hood

Digimarc Founder Geoff Rhoads On Digital Watermark Technology

WHAT IS STEGANOGRAPHY, AND HOW DID YOU COME TO SEE IT AS APPROPRIATE TECHNOLOGY for this application?

Steganography snuck in the back door rather than me going in through its front door—the original idea was simply to "subtly change a photograph" in such a way as to place in a low-level binary identification tag.

I later realized this was merely an example of the age-old craft arcanely known as "steganography." The name was so interesting that we decided to embrace it rather than attempt to avoid it. There are 101 definitions of the term, but essentially, its refers to just the above: putting a message into/onto something in a way that is not obvious but can be read by someone looking for the message. The definition is therefore quite broad and the flavors of actual steganography extremely diverse.

With regard to the digital watermark itself—I have heard that is it is possible to remove the watermark by running the image through different Photoshop filters. Since I also read online someplace that legislation was being proposed making it a crime to remove a digital watermark, this sounds plausible.

If this is true, how does Digimarc plan to address this problem? If false, please explain!

By definition, any stamp you put onto something which can be read by a broad cross-section of people can also be removed. We've attempted to make that difficult but never dreamed of rendering that impossible.

The confusion lies between the concepts of public communication—which is what Digimarc accomplishes—versus private encryption and security. We've targeted the former as the most crucial issue today—how does one publicly announce one's ownership such that the person handling the image is alerted to the ownership status of the image and how to contact the image creator or distributor? This opens up commerce and licensing opportunities, while also removing the claim of inadvertent infringement.

Another benefit to public communication is that images can therefore be tracked and usage monitored, which would be far more problematical with purely encrypted images.

If someone wants to truly rip off an artist through the manipulation of a watermark, then there is nothing anyone, including Digimarc, can do to prevent this. To be sure, though, Digimarc will add more capabilities on the "security" side in the future.

But, back to your original question—the watermark is like any communications channel in that the more you "distort" the signal, the harder it is to read. In our case, we have designed it so that a fair amount of distortion, or filters to be precise, are required before the watermark starts to fade. So, although one can reduce the watermark energy, it typically requires a compromise to the commercial value of the image.

Our first version of software was reasonably strong in this regard; our next version just coming out is significantly better and there is more to come.

Also, although I don't believe it is currently a US federal crime to intentionally remove a watermark, there is legislation proposed which does address the broader criminality of defeating legitimate copyright protection mechanisms. To be sure, though, there are existing laws against fraud, misrepresentation and copyright infringement which is the net effect of removing a watermark and redistributing the image. Imagine an infringement suit where the defendent is known to have erased a watermark: the penalty may easily be another "zero" tacked on.

Larry Logan told us the watermark survives print—i.e. if the file is printed, and the print rescanned, the watermark comes along. Would you explain how this works? Do you have problems with moire and other artifacts in such situations?

The situation here is very similar to what happens with filters above—the resulting watermarked image simply sees "distortion," and the watermark is either read or it isn't read, depending on the severity of the distortion.

We have found that with typical web press printing, the distortion is low enough that we can still read the watermark. Once you get into very coarse line screen printing (below 80–90 lpi) and/or small patches of images, we do lose the ability to read the watermark, as the signal just gets too weak.

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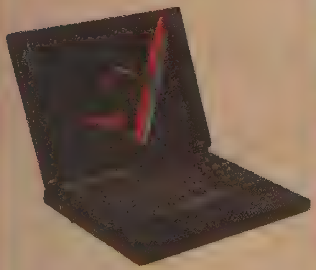

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7710MT	Pent-™/150MMX	16MB	1.6GB	12.1" Active Clr	$2618.
7730MT	Pent-™/166MMX	32MB	2.1GB	12.1" Active Clr	$4108.
7750MT	Pent-™/166MMX	32MB	3.0GB	12.1" Active Clr	$4671.
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- KeyTronics 104 Win95 Keyboard
- Logitech Serial Mouse
- MID Tower Case w/230 PS
- Free CD Grolier's Ency. 97
- **AMD K6-166MHz $1139**
- **AMD K6-200/ 233MHz $1199/ 1399**
- **Cyrix 6x86MX 166/ 200MHz $1109/ 1159**
- **Intel Pentium® 166MHz $1179**
- **Intel Pentium® 200/ 233MHz $1299/ 1399**

STAR #3
NetSystems

- AMD/CYRIX/Pentium® Processor w/MMX
- Triton TX 512K Pipeline Burst Cache
- 32MB of EDO RAM
- 3.5GB EIDE Hard Drive (10ms)
- 3.5" 1.44MB Floppy Drive
- 17" 1280x1024 .28 NI Monitor (13.9" v.i.s.)
- Matrox Mystique 220 4MB SGRAM MMX Technology
- Toshiba 24X IDE CD-ROM Drive Ready
- Yamaha 16 bit Sound w/60W Speakers
- KeyTronics 104 Win95 Keyboard
- Logitech Serial Mouse/Pad
- US Robotics 33.6 Fax/Modem
- Microsoft Windows 95 CD
- MID Tower Case w/230 PS
- Free CD Grolier's Ency. 97
- **AMD K6-166MHz . . . $1399**
- **AMD K6-200/ 233MHz $1499/ 1699**
- **Cyrix 6x86MX 166/ 200MHz $1389/ 1429**
- **Intel Pentium® 166MHz $1459**
- **Intel Pentium® 200/ 233MHz $1569/ 1689**

STAR #4
NetSystems

- Intel 166MHz Pentium® Processor MMX
- FIC VIA 1024K Pipeline Burst Cache
- 64MB of EDO RAM
- 4.3GB EIDE Hard Drive (10ms)
- 3.5" 1.44MB Floppy Drive
- New Matrox Millennium II 4MB WRAM
- 15" 1280x1024 .28 NI Monitor (15.9" v.i.s.) MMX Technology
- Toshiba 24X EIDE CD-ROM Drive Ready
- Sound Blaster 16 Sound/60W Speakers
- 56K Fax/Modem w/DSVD Technology
- KeyTronics 104 Win95 Keyboard
- Logitech Serial Mouse/Pad
- Microsoft Windows 95 CD
- Mid Tower Case w/250 PS
- Free CD Grolier's Ency. 97

$1499

200MHz $1599
233MHz $1699

STAR #5
NetSystems

- Intel 166MHz Pentium® Processor MMX
- ASUS TX97X 512K Pipeline Burst Cache
- 64MB of EDO RAM
- 5.1GB EIDE Hard Drive (10ms)
- 3.5" 1.44MB Floppy Drive
- New Matrox Millennium II 4MB WRAM
- Sony 200sf 17" 1280x1024 .25 NI Monitor MMX Technology
- Toshiba 24X EIDE CD-ROM Drive Ready
- Sound Blaster AWE 64 Sound
- US Robotics 56K Fax/Modem
- KeyTronics 104 Win95 Keyboard
- Logitech PS2 Mouse/Pad
- Amplified 240W Speakers
- Microsoft Windows 95 CD
- ATX Mid Tower Case w/250 PS
- Free CD Grolier's Ency. 97

$2199

200MHz $2299
233MHz $2399

STAR #6
NetSystems

- Intel 166MHz Pentium® Processor MMX
- Intel AN430TX 512K Pipeline Burst Cache
- 32MB of 168-Pin EDO Memory
- 2.5GB EIDE Hard Drive
- 3.5" 1.44MB Floppy Drive
- Diamond Stealth 3D 2000 4MB DRAM
- 15" 1280x1024 .28 Monitor (13.9 v.i.s) MMX Technology
- Toshiba 24X EIDE CD-ROM Drive Ready
- Yamaha 16 bit Sound w/60w Speakers
- Microsoft Windows 95
- KeyTronics 104 Win95 Keyboard
- Logitech Serial Mouse/Pad
- US Robotics 33.6 Fax/Modem
- ATX Mid Tower Case w/250 PS
- Free CD Grolier's Ency. 97

$1299

200MHz $1399
233MHz $1499

STAR #7
Multimedia Systems

- Intel 233MHz Pentium® II Processor MMX
- Intel Portland 512K Pipeline Burst Cache
- 32MB of EDO ECC Memory (10NS)
- 2.5GB EIDE Hard Drive (10ms)
- 3.5" 1.44MB Floppy Drive
- Matrox Mystique 220 4MB SGRAM
- 15" 1280x1024 .28 Monitor (15.9" v.i.s.) MMX Technology
- Toshiba 24X IDE CD-ROM Drive Ready
- Yamaha 16 Bit Sound w/60W Speakers
- Microsoft Windows 95
- KeyTronics 104 Win95 Keyboard
- Logitech PS2 Mouse
- US Robotics 33.6 Fax/Modem
- ATX Mid Tower Case w/250 PS
- Free CD Grolier's Ency. 97

$1699

266MHz $1799
300MHz $2099

STAR #8
NetSystems

- Intel 233MHz Pentium® II Processor MMX
- ASUS P2L97 512K Pipeline Burst Cache
- 64MB of EDO Memory
- 3.5GB Hard Drive (9.5ms)
- 3.5" 1.44MB Floppy Drive
- Diamond Fire GL1000 8MB SGRAM MMX Technology
- ViewSonic PT770 17" .25 Trinitron Monitor Ready
- (15.9" v.i.s. 1600x1280 max.res.)
- Toshiba 24X EIDE CD-ROM Drive
- Sound Blaster AWE 64 Sound
- Microsoft Windows 95
- KeyTronics Win 95104 Keyboard
- Logitech PS2 Mouse
- 56K Fax/Modem w/DSVD Technology
- Yamaha M7 Speakers
- ATX Mid Tower Case w/250 PS

$2399

266MHz $2499
300MHz $2799

STAR #9
NetSystems

- Intel 233MHz Pentium® II Processor MMX
- Intel Atlanta AL440LX 512K L2 Cache
- 64MB of EDO ECC Memory (10NS)
- 5.1GB Hard Drive (9.5ms)
- 3.5" 1.44MB Floppy Drive
- NEW Matrox Millennium II 8MB WRAM MMX Technology
- ViewSonic G771 17" .27 Monitor Ready
- (15.9" v.i.s. 1280x1024 max. res.)
- Toshiba 24X EIDE CD-ROM Drive
- Built-in Yamaha Sound
- Microsoft Windows 95
- KeyTronics 104 Win95 Keyboard
- Logitech PS2 Mouse
- US Robotics 56K Fax/Modem
- Yamaha M15 Speakers
- ATX Mid Tower Case w/250 PS

$2599

266MHz $2699
300MHz $2999

STAR #10
NetSystems

- Intel 233MHz Pentium® II Processor MMX
- ASUS P2L97 512K Pipeline Burst Cache
- 64MB of EDO ECC Memory (10NS)
- 4.3GB Ultra-Wide SCSI Hard Drive (8.5MS)
- Adaptec 2940 Ultra-Wide SCSI Controller
- 3.5" 1.44MB Floppy Drive
- NEW Matrox Millennium II 8MB WRAM MMX Technology
- Sony 200SF 17" .25 Trinitron Monitor Ready
- (15.9" v.i.s. 1280x1024 max.res.)
- Toshiba 15X SCSI CD-ROM Drive
- Sound Blaster AWE 64 Gold Sound
- Microsoft Windows 95
- Microsoft Natural 104 Win95 Keyboard
- Logitech PS2 Mouse
- US Robotics 56K x2 Fax/Modem
- Yamaha System 45 w/Sub Woofer
- Iomega Zip IDE 100MB w/Cartridge
- ATX Mid Tower Case w/250 PS

$3699

266MHz $3799
300MHz $4099

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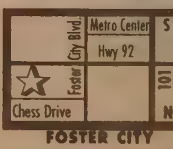

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- Microsoft Windows 95
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- 3.5" 1.44MB Floppy Drive
- PCI 64 2/4MB EDO with 16M True Colors
- 16X EIDE CD-ROM Drive
- 3 Type II & Type III PCMCIA Slots
- Touchpad Win95 Keyboard
- 16 Bit Sound Card w/Speakers
- NiMH Battery (6800XL for Li-Ion)
- AC Adapter, Carrying Case
- Microsoft Windows 95
- AC Inside Adapter/Hot Docking

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200MHz MMX	$1839	$2339
233MHz MMX	$1959	$2459

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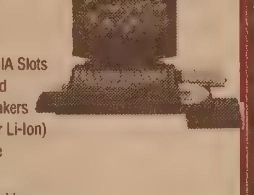
- 3 Type II & Type III PCMCIA Slots
- Touchpad Win95 Keyboard
- 16 Bit Sound Card w/Speakers
- NIMH Battery (6800XL for Li-Ion)
- AC Adapter, Carrying Case
- Microsoft Windows 95
- AC Inside Adapter/Hot Docking



	13.3" TFT Active Matrix	14.1"TFT Active Matrix
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166MHz MMX	$2839	$3399
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CHEMBOOK 9750 SERIAL

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- PCI 2MB EDO with 16M True Colors
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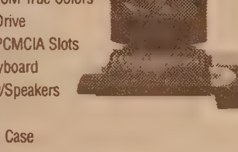
- 2 Type II & Type III PCMCIA Slots
- Touchpad Win95 Keyboard
- 16 Bit Sound Card w/Speakers
- NiMH Battery
- AC Adapter, Carrying Case
- Microsoft Windows 95



	12.1" Dual scan	12.1"TFT Active Matrix
166MHz	$1699	$2199
166MHz MMX	$1739	$2239
200MHz MMX	$1839	$2339
233MHz MMX	$1959	$2459

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FIC Triton VX 512K 75-200MHz	$89
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Digital Watermarks

continued from page 106

on Skylab. Geoff figured out a way to virtually do that, patented the process, built these extraordinary cameras.

The way he was able to do it was what's called "removing random noise in nature." It's a filtration of light diffraction, light bending, noise that's in optics—a whole host of characteristics that can be filtered out by powerful algorithms. There are dual cameras, a subtractive process, filtering, a whole bunch of stuff.

Geoff went off to sell these, and got a tremendous amount of attention in the press. And as he saw his images in the press, he started to see them migrate to other publications. He started hearing from his astronomer friends who said "You've really just stepped into something—the images are so incredible that people are going to think they're from NASA, they're going to think they're public domain, and that they can have them for free."

Because after all, everything they've seen that looks this good *is* from NASA.

Absolutely. How can anyone shoot these incredible images outside of a government project?

So Geoff ran up against the idea of infringement very quickly, and found himself a classic case.

The other thing that he found was that astronomers have no money [*laughs*]. So as a commercial venture, to get rich selling these cameras was going to be a difficult proposition.

Well, then the light went off, and he said, "If I can remove noise from an image, what if I put noise back *into* an image, at a very low level, imperceptible to the eye, but use that noise to serve as a carrier for a message, for communication?"

Steganography.

Steganography. That's a little-known science of embedding a content-carrying message. It goes back hundreds of years.

Geoff spent three years doing R&D as to how to do this inside of images, and went off and filed fifteen different patents, which have either been awarded or are in the process of being awarded, covering a remarkably broad area of embedded content, whether it's audio or video or still imaging.

No one has ever thought about doing the kinds of things Geoff's doing, where years from now you're talking about an entire community of rights management, founded upon watermarks and embedded content.

A little over a year and a half ago the company was formalized into Digimarc. Adobe came in as one of the early investors; we had two large Japanese companies that came in as investors, Just Systems and Softbank; also EVI Venture Capital led the round of investment for the Bay Area. The first product was called PictureMarc; it allows still-image embedding, and that's what was bundled into Photoshop, starting in November.

We're off and running now; we have thousands of individual subscribers at $99; we have a large number of corporate accounts, from 20th Century Fox to *Playboy*. Virtually every major stock agency is a Digimarc licensee.

We've been declared pretty decisively to be the de facto standard for watermarking. It's a fascinating area, and certainly other companies want to move into this space. There are some intellectual property issues that would make it difficult for them over time, but there's one other key reason why we've been successful.

> **It just takes a couple of seconds to embed the information. Once it's in the image, it's buried throughout the image, and wherever that image travels, whether it's in digital form on the Web or in printed form, it's carrying that watermark.**

Let's say I go down to the corner software shop and buy XYZ's Digital Watermarking Software. If I send the image out there, the only way to read it would be if you went out and bought XYZ Software reader, and the odds of that are pretty remote, because whenever you go out and buy Photoshop, Corel, all these other products, you already have the reader. So when you see that image and open it, I have confidence at my end, as the one who's distributing the image, that you can find out that information.

That's another reason Digimarc became everyone's standard, because I know with confidence that you've got the tools to read it, and that wouldn't be the case with any other company.

Being first to market was a critical step. Being with Photoshop overnight, yes. Including the whole system was a key component.

Also, what we're announcing at the show is that MarcSpider is up and running. Here's where it completes everything.

Up till now, I could embed, I could send it out there. You had the tools, you can read it, and using what we call MarcCentre, using the Internet or our faxback service or our 1-800 number—again at no cost to you—you could find out everything about me as the contact, as the creator or distributor of the image.

MarcSpider goes out on the Web and gives the subscriber to Digimarc a report showing the places on the Web where these images are being reproduced.

It's doing this monthly?

Yes. As an individual subscriber, I get a monthly report. If I'm a corporation, it's updated constantly, and also provides some powerful filtering tools for how I might want to manage that information, what kind of databases it might report to.

As a practical thing, at the $99 individual level, I can go to the site once a month, see thumbnails of all my images; one click and I'm right there to that site that's using the image. Maybe I've licensed those people, maybe not; here's a chance to get incremental licensing revenue by saying "Excuse me, I see you have my image. For two or three hundred dollars (or whatever) you can keep it up there. Give me your credit card number, we'll take care of it."

Or it could be "Excuse me, but you're making money from my images." Or maybe "You're placing them with images that I don't particularly care to have my name associated with. And therefore I'm going to ask you to cease and desist, get it off your site."

Out of hundreds of millions of Web pages, what are the chances of me, as a distributor, finding how my images are being displayed and "borrowed," for a euphemism? Now with MarcSpider, I'll know that information.

What are your products and what is your business model? I see how you help other people make money, but how do you make money yourselves?

The tools are already embedded, so therefore you're not making an extra software purchase.

There are several different levels of subscriptions to Digimarc. You might think of it

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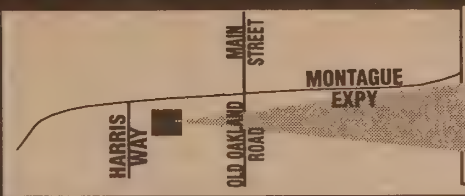

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Matrox 4MB Mystique SGRAM
Keytronic 104 Enhanced Keyboard
Tower Case ATX w/ PS2 Bus Mouse
TEAC 1.44 MB - Microsoft Mouse

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INTEL 100/133/200/200M/233M

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AMD K5 100/133/200/233MMX

AMD K5 100/133/200MMX/233MMX
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Middle Tower Case w/ 230 PS
Teac 1.44 MB - Microsoft Mouse

680 / 720 / 890 / 970

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as taking out a Yellow Pages ad or a White Pages ad.

For $99 we have what's called the professional service. That service gives you something much like a Yellow Pages listing—all the complete contact information so that you see my image; if I have paid Digimarc $99, then when you go to look up information on me you'll get all the contact information.

We're announcing at the show a new service that's free. Anyone can now embed information into an image and have it read at the other end at no cost. Think of this more like a White Pages listing. When you read my image, if I'm a free subscriber, you will not get all the robust information, but what you'll see when you look up the image is a proper copyright notice—©, year, first name, last name, "all rights reserved." That's what you'll find out about me.

We knew from the beginning that there was a large market which we are now ready to address, all the way from students to advanced amateurs to professionals, who want to try the system before paying $99 a year. This allows them to sleep better at night, knowing pride of ownership, pride of authorship: "I was able to put a communication in that image. Maybe I'm not making a living now with my images, but I hope to someday as I get more involved."

In the meantime, people can look at your portfolio online.

In the meantime, they can see the copyright notification, and if I do ever want to go after someone, then I can show them that yes, they have gotten notification, they did infringe, they were notified that it was copyrighted by me.

Now in the future, if you were to jump up to the professional series, you do not need to go back and re-watermark my images. Digimarc has already captured all of your contact information, even if you sign up for free. So ten years from now you could have put thousands of images out there; you jump from free to $99, and instantly we'll flip a switch at our end so that anyone reading those old images, so to speak, won't just see the copyright notification; now they'll see all the complete contact information. Your images are working for you, once again, in the future.

Is all the information always there and just hidden, or is it linked to another database?

There's always the linkage. Once again, the watermark is simply a pointer within the image; now when somebody reads the information, what it points to is all the complete contact information, not just the copyright.

The other thing is that MarcSpider is included in the $99 subscription, to show you where your images are. MarcSpider's not included in the free subscription. Another way to think of MarcSpider is as a clipping service.

Suppose you're 20th Century Fox, what kind of service do you get?

In the same way that now we have have the Personal Autograph series, being the professional service, and Personal Lite, the two levels of individual subscriptions, we now have the Digimarc Corporate series.

There are three levels, from a small company at $850 up to a large corporation from $5,000–20,000 depending upon extra services that they want. They get more powerful MarcSpider reporting; there's software that can actually automate the batch watermarking of large archives, so they can work day and night doing thousands of images based on databases. They can get service agreements with us. The prices I'm giving you are for the first year, and then in successive years it drops back.

Stars are putting the onus on the studios: "Look, I don't want to see these images in an Italian magazine."

We add more services. Also, the number of images we're going to find for 20th Century Fox—considering "The X-Files" and the next *Alien 4* film coming out, and "The Simpsons," there's going to be an awful lot of work that we're going to do on our end to find those images.

Those little bots will be hustling for a while.

Well, actually, we try and be very sensitive as a Netizen. We've worked long and hard at finding sophisticated ways of not just randomly scouring the Web; there's feeds that we get, only showing where there's images, so we don't even touch pages. We work very hard to lower the overhead that we would put on the Web. We've come up with a number of ways also of working with the large directory services. It's pretty efficient; we're about as nice a citizen as we can be in that respect.

So for all practical purposes, you make money by having bundling agreements with people like Adobe, and by selling essentially a service to content owners at various pricing levels, and your overhead is maintaining the database for all that.

Our overhead is certainly the amount of intensive computing of MarcSpider. Our overhead is also that, if you read an image and you're not on the Web, we'll send a fax to you anywhere in the world with all that contact information. So although we're charging $99, we could end up spending $200 on an individual photographer in a year.

You're sort of a clearing house.

Yes.

Our tremendous overhead is in engineering, because last November, although we knew internally about MarcSpider, people were quite content with embedding a watermark and letting people read it. Now we've come up with MarcSpider, and there'll be other tools and processes in the future that will make life so much easier for the distributor or the creator of the image, that'll be wonderful add-ons to what we already do.

All those require tremendous amounts of R&D and engineering, and we're very fortunate to have some of the very best and brightest on the team, from Geoff on down.

Working at making it faster and smaller...

Absolutely. Always tweaking at the basic core process, the PictureMarc module—but there will be other modules that sit on top of it that can allow other features and functions.

As I understand it, this technology is very well suited to graphics and not at all suited to text, because you can't embed the watermark invisibly in a text file, so writers who need to protect their stuff will have to use something else.

Right. There will be something in the future that will likely address that in a quite different way from what we're doing right now, but the basic software as it exists now is not suitable for text.

Is this an area you plan to go into?

Principally we do graphics. Our big move now is into video; we've already done the lion's share in the still-imaging market, to be known and to set the standard. Now we're moving into video; we just announced a collaboration with

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Macrovision for the first DVD copyright solution, which is before the various committees right now.

We will also work in different kinds of video: Everything from electronic QuickTime AVI will be embedded in that, and ultimately MarcSpider will find video files also as a service. Ultimately we'll be on the print that's projected on the big screen at your motion picture theater.

When you say video, it's very broad, all the way from your home music video VHS duplication and slaves, to, again, electronic files on the Web.

Moving images are just a larger stack of still images, but at thirty frames a second that's an awful lot of watermarks to be putting into images. Are there technical challenges with moving images that you don't have with stills?

More of a time demand. The technology is virtually identical. It's more of us working in concert with the different insertion points, whereas with still imaging it's real simple.

With video, if it's DVD, where the watermarks are put and where they're read is going to be quite different from the equivalents in the motion picture industry. Each one of these requires a slightly different tool and process. Therefore it takes us a little longer to figure out who might be our partner—in the same way we have Adobe on the still side, it's very nice to have major partners for these different processes, like Macrovision for the DVD, because they have an awful lot of preexisting capabilities and competencies and installed base and whatnot, and we bring the technology to it.

We'll knock those down one by one.

Do you see this extending into sound?

Mm-hm. For one thing, there's the issue of sampling.

Artists have very different attitudes about whether they want to be sampled or not.

With our technology and patents, we can do audio. We've elected to do it last, or a little further down than still imaging, video and motion pictures.

There's a first wave that's trying watermarking now; we think there's some unique things that, when we come to the market, will make it different. There's less demand—as much as the recording studios are being hurt by infringement, the way they're currently being distributed and how things are currently worked, it's our sense that we can wait a little bit.

We've only mentioned a few industry groups. There's a whole bunch of vertical markets: insurance fraud; government, where we can validate the integrity of passports, for example. There's a whole bunch of other areas we can work in, and we have to be careful not to get spread too thin chasing after all the different markets where the technology has applications.

You mentioned about artists—one of the things about Digimarc is, we're not the cybercops. We don't want to be the agents or representatives of the artists. We just simply want to provide the tools, provide the information. Now it's elective.

You get 20th Century Fox, and they go to a site, and they say, "Oh, it's a fan's site, that's fine." The same way with recording artists. Other times, they're concerned—"That's my property and we need to work something out." But at least that's a conscious choice, armed with the information.

There's a whole bunch of areas we can work in, and we have to be careful not to get spread too thin.

If it's a teenager's "X-Files" fan site, that's different from sites that are charging for the images.

Quite different.

For the last couple of years, a lot of the restrictions have been coming from the stars themselves. They're actually putting the onus on the studio: "Look, I don't want to see these images in an Italian magazine. I don't want to see this, I don't want to see that."

It's very difficult for the studios to monitor and track this, and one of the things that Digimarc can do for them is to indeed track it, so if they take Gillian Anderson and cut off her head and put it on a Playmate body or something, they can step in and ask that that not be done, perhaps. It also shows to the artist and the artist's management that they are using the most technologically advanced means to indeed try and monitor use of the images.

Does this have any applications for things like copy-protecting software?

No. We need a certain amount of randomness in nature, and in the pure ones and zeros that is software code, there's no place for us to hide, and we have no thoughts now about any other kinds of technology to work in that area.

It goes back to the fact that we want to be the leaders in embedded content, and even the word "embedded" means that there's got to be a place to do that. The ones and zeros don't provide any woods to go hide in, so to speak.

If you put in something that didn't belong, your program would crash and things would get ugly.

Oh, absolutely.

This is essentially platform-independent? You create an image with Photoshop on the Mac, but somebody out on the Web is using God knows what and they can still get the image and the information?

Absolutely. Ultimately we'll be in the browsers, but it really doesn't make a difference.

We're file-independent because we're at the lowest level, simply affecting the pixels, so to speak, so if people change the file name it doesn't make any difference. However you read that image, from whatever platform, you're really just looking at the basic pixels of the image, and that's where we reside.

I know a lot of photographers who are really excited about the Net, but they're worried about how easy it is to grab the images.

We have numerous Web site developers coming to us, saying "I'm having a very difficult time getting images from certain creators; they've heard all the horror stories in the publications, that as soon as you put your images up you're going to be ripped off; it's a giant copy machine..."

All of it's true.

But now they're saying, "I want to go ahead and hook up with you folks so I can go back to that image creator and give them some comfort, that we can manage their images."

And it's working very, very well in that respect.

The original focus was on the image creator, principally the photographer and the studio. That was the start, but now only a third of our market is the photography industry or the stock photo agencies; the rest is Web designers, companies with Web sites, Webmasters—it's really an electronic medium. ■

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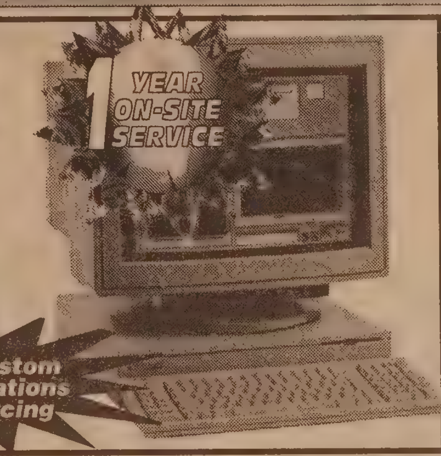

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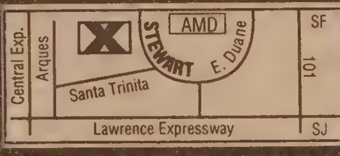

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Software Vendors Vs. Software Pirates

The Internet Expands The Battlefield

By David Noack

Earlier this year, software giant Microsoft Corp. filed a first-of-its-kind lawsuit against a Minneapolis man who, it claims, surfed the Internet, telling online Netizens where to get the company's new Office 97 program for free.

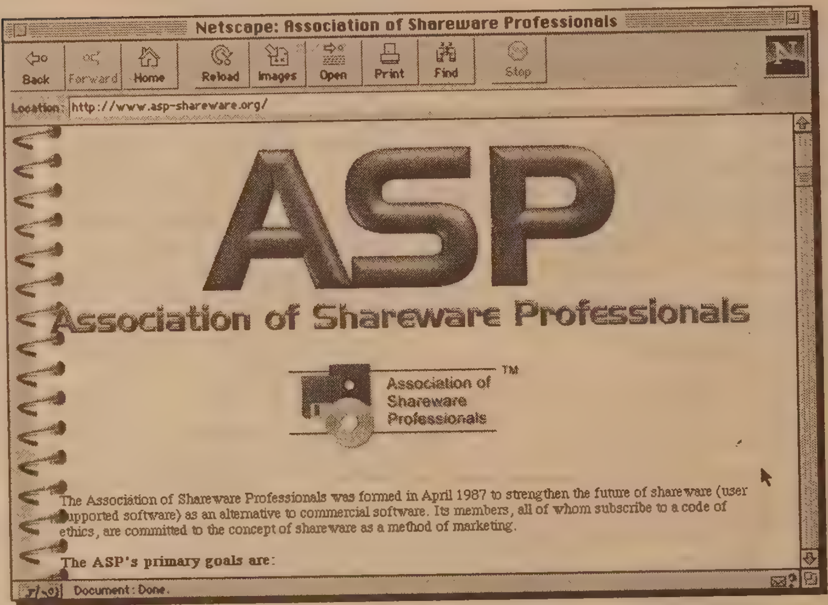
The man allegedly published the code that was able to turn a $4.99 CD-ROM demonstration version of the firm's latest software suite into the real thing, which normally retails for $400.

The legal action, filed in federal court, charged the man with copyright infringement by distributing a computer file that let users break the security code, enabling them to use the program for good.

A couple of years ago, the operator of a computer bulletin board in Toronto was charged with software piracy for allegedly distributing illegal copies of software from Symantec Corp., its subsidiary, Delrina (Canada) Corp., and Microsoft.

Officials said that one of the operators of the BBS also sold—for $70 Canadian—a CD-ROM containing unauthorized copies of Microsoft, Delrina and Symantec programs.

And a Seattle-area man was hit with a copyright infringement lawsuit—in another unprecedented legal action—for allegedly distributing software on the Internet.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The Association of Shareware Professionals was formed in April 1987 to strengthen the future of shareware (user supported software) as an alternative to commercial software. Its members, all of whom subscribe to a code of ethics, are committed to the concept of shareware as a method of marketing.

The ASP's primary goals are:

The lawsuit charged that the man illegally uploaded copyrighted software via File Transfer Protocol (FTP) to an Internet Service Provider (ISP) for distribution across the Internet.

These cases, along with hundreds more, are just the tip of the iceberg when it comes to the ongoing and aggressive crackdown by the software industry and law enforcement officials against software pirates.

The most common form of software piracy occurs when someone buys a piece of shrink-wrapped software from a store and then makes multiple copies in violation of the license agreement (Most licensing agreements allow users to create a backup copy of the software; others are more liberal and allow installation of the software on all the user's machines—e.g. desktop and notebook computer—as long as only one copy is in use at a time).

But other illegal activities fall under the umbrella of software piracy: software rental; software counterfeiting; hard disk loading, where computer dealers install unauthorized copies of software on a PC as an incentive to the buyer (not to be confused with the also-common practice of preloading legal software for customer convenience, as evidenced by the vendor's providing backup disks, registration materials, and serial numbers); and simply downloading software via the Internet or bulletin board systems.

The Industry View

Software vendors say that trafficking in illegal software costs them billions annually, penalizes people who legally purchase software, hurts companies that obtain costly site licenses, and hampers product innovation and quality control.

But even with all the publicity and enforcement actions against software pirates, the problem continues to grow, say software trade groups.

At one time or another, you've probably heard this warning: "Don't copy that floppy." That phrase is part of the long-standing, anti-software piracy campaign that the Washington, D.C.-based Software Publishers Association has promoted for years in a effort to put a dent in software piracy.

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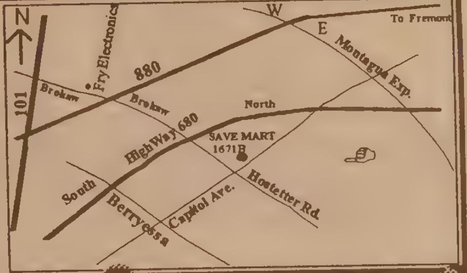

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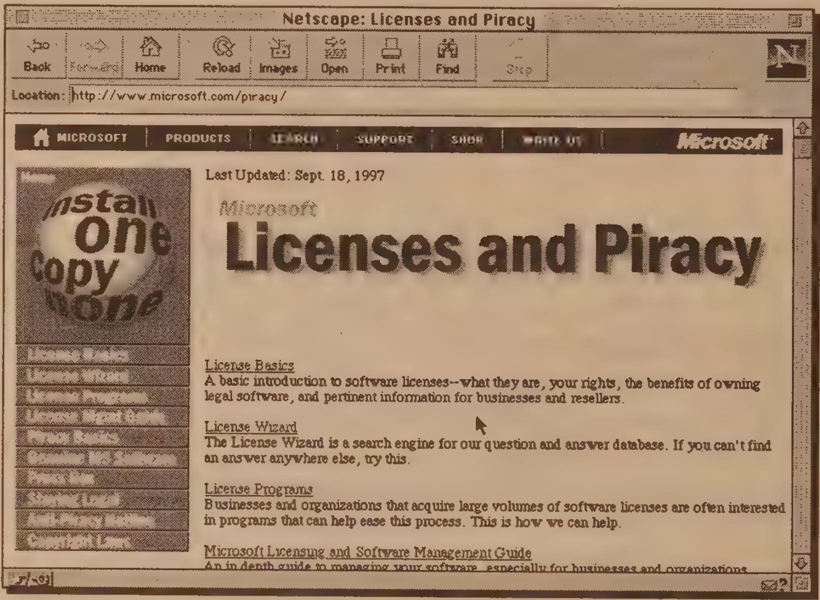
US ROBOTICS 56 K /Voice (Ex)	199/215

The effort appears to be making some headway, with the SPA's dozen years of anti-piracy efforts slicing US piracy rates in half since the late 1980s.

The SPA, along with its rival, the Business Software Alliance (BSA), another software trade organization, are engaged in a long-term battle over software piracy, through educational, ethical and enforcement efforts.

The SPA and BSA, in their latest software piracy study—which is now done by an outside firm—found that pilfered software rose 20% last year. Software publishers in North America lost $2.7 billion, while revenue losses worldwide reached $11.2 billion.


Netscape: Licenses and Piracy

Location: http://www.microsoft.com/piracy/

Last Updated: Sept. 18, 1997

Microsoft

Licenses and Piracy

License Basics
A basic introduction to software licenses--what they are, your rights, the benefits of owning legal software, and pertinent information for businesses and resellers.

License Wizard
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License Programs
Businesses and organizations that acquire large volumes of software licenses are often interested in programs that can help ease this process. This is how we can help.

Microsoft Licensing and Software Management Guide
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But the latest figure represents a 16% drop from a year earlier, when the estimated losses worldwide totaled $13.3 billion.

Software piracy does not honor geographic boundaries. Overseas piracy is an even bigger headache and more difficult to curtail because of different laws and lax enforcement.

The software industry study says that Eastern Europe had the highest piracy rate, with some 80% of the software being pirated, while 28% of the software in North America is copied.

China and Russia are the biggest problem areas; the SPA has identified them as "one-copy" countries, in which a single copy of a program could satisfy the entire country's demand.

Cui Bono? Various Perspectives

But can any of these figures be trusted? Isn't it in the best interest of software makers to paint the worst picture, in order to get federal lawmakers to pass tougher laws or maybe to serve as a rationale to charge higher prices for software?

In a February 10 article in the *St. Petersburg (Florida) Times*, the SPA and BSA "acknowledge that they may have been overstating the losses suffered by software companies due to illegal copying."

A spokesman is quoted: "We've been hyping the numbers that might or might not be true. Look, all we can do is guess how many people who use computers in China or Bulgaria might actually be willing to pay for Microsoft Office or *DOOM*. But larger numbers get more attention, so we go with the biggest estimate we can get away with."

The Association of Shareware Professionals (ASP), which represents shareware developers, is well aware of the problem of software not being registered and shareware developers not being compensated.

Bob Ostrander, president of the Association of Shareware Professionals (ASP), says that as far as his group is concerned, the growth and unstructured nature of the Internet and BBSes make it impossible to know how many programs are transferred, or how many people are using shareware programs without registering the software.

He adds that the ASP is holding discussions with a New York law enforcement agency over a particular case. "There have been several successful civil decisions and out-of-court settlements brought by shareware publishers against pirates—notably the old Datastorm decision and MVP Productions."

He explains that the usual suspects—passwords, cracks, patches, serial numbers—existed on computer BBSes long before the Internet became so popular. The only thing the Internet has done is make it easier to find this information.

"People probably look for cracks simply because they don't want to spend the money. I doubt anyone begrudges Joe Programmer the bucks or even Phil Katz or Niko Mak. Maybe Microsoft, but I'm answering this from a shareware perspective. And yes, Netscape [Navigator] is shareware, but they aren't ASP members."

One computer user, who is familiar with security issues and did not want to be named, speculates that some software companies don't mind software being cracked, especially if it's the competition's. "Do you think for a minute that a company like Microsoft doesn't like us out there hacking systems and cracking the other guy's programs? You're damn right they want us to. The less security a big giant like Microsoft can show the other company has, not only in the security of their company's computer systems, but their software as well, the more it's a plus for the big giant."

Another computer user notes that "people don't pirate software to be malicious, they pirate them because it's the only way they can afford to get a copy. Many pirates I know buy when they can, but pirate what they can't."

ISPs In The Middle

The lawsuit against the Washington State man, made by the SPA on behalf of three software companies, Cinco Networks, Inc., Symantec Corp., and Traveling Software Inc, was the result of a tip to the SPA's anti-piracy hotline by ABWAM, Inc., a Colorado-based ISP, through which the software was being uploaded. The ISP noticed a large number of files being uploaded to its FTP server.

There is now a bill in Congress that would relieve the legal liability of the commercial online services, BBSes and ISPs for having copyrighted material on their servers. But the legislation does not let the online services off the hook if they know about copyrighted or commercial software being trafficked.

The so-called Online Copyright Limitation Liability Act exempts online services and ISPs from liability for copyright violations, if the companies don't know about it and haven't profited from it.

On the Internet, there are about a half dozen Usenet newsgroups, such as *alt.binaries.warez.ibm-pc*, *alt.binaries.misc*, *alt.binaries.slack*, *alt.binaries.cracks*, and *alt.cracks* which contain copyrighted software, with users asking for certain disks of a program; many times an entire program is posted. And pirated software on BBSes is nothing new.

The CD-ROM Peril

While the Internet and floppy disks are the most prominent ways that copyrighted software is copied and transferred, a bigger problem lies with the loads of real estate available on the CD-ROM's.

The SPA views the CD-ROM threat this way:

As the cost of CD recorders (CD-Rs) decreases, the threat of software pirates loading programs onto CD-ROMs increases.

SPA is looking into ways to blunt the problem using a range of software and hardware solutions, legal and legislative remedies and

continued on page 222

Paramount Computer *Now Open in Fairfield*

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Asus TX97/512K + Pentium 166MMX	$300
Asus TX97/512k + AMD K6 233MMX	$518
Asus TX97/512k + AMD K6 200MMX	$338
Asus TX97/512k + AMD K6 166MMX	$278

VIDEO CARDS

❖TRIDENT	
512k/ 1MB ISA/1MB PCI	24/33/30
❖DIAMOND	
Stealth 3-D 2mb/4mb EDO	60/83
Monster 3-D w/4mb Dram	155
3D 3000 2MB/4MB VR	110/150
FireGL 1000Pro w/4mb/8mb	172/206
Viper 330 AGP 4mb/8mb	172/206
❖SPIDER	
Tarantula 64 MK II 2MB VR	50
Tarantula 3-D 4MB EDO	50
❖MATROX	
Millenium II 4MB WR oe/re	195/210
Millenium II 8MB WR oe/re	260/275
Mystique 220 4MB oem/ret	140/150
Mystique Rainbow Runner ret	184
❖ATI	
3D ProturboPC2TV 4MB/8MB	135/175
All-In-Wonder 2MB/4MB	182/196
XPERT@PLAY 4MB/8MB	182/230
XPERT@WORK 4MB/8MB	170/215

MONITORS

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TX-D7S(20")	1620
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❖VIEWSONIC	
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P815(21")/ E655	1410/278
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17GA/G771	570/510
17PS/17EA	630/530
G800 / G810	985/1190
GT770/GT775	617/630
PT770/PT 813	640/1344
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❖IIYAMA	
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❖MGC	
NI 14" Monitor 0.28	150
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OR-technology LS-120	147

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Adap. PCI 2940UWw/SWOEM	194

CASES

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SOFTWARE

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- Teac 1.44MB Floppy Drive
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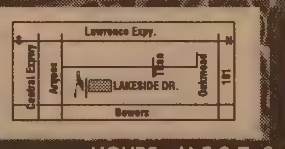

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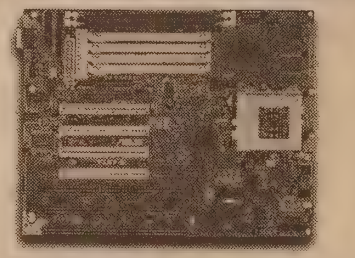

MB+CPU	166MHz	200MHz	233MHz
Intel MMX	$295	$385	$495
AMD	$275	$355	$455

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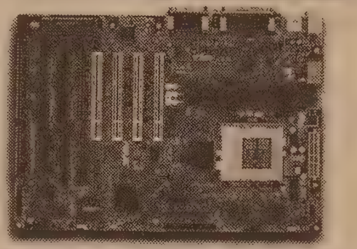

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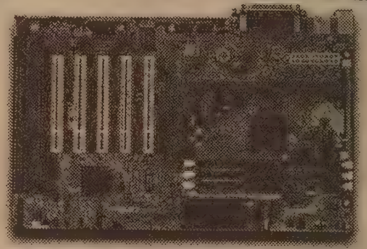

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Intel Pentium® II	$745	$845	$1095

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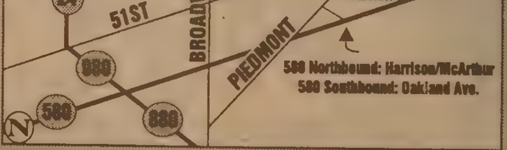

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* Mouse w/ Pad
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3.5GB 64MB SDRAM AGP Port

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Cache include Intel MMX Technology
*Asus P2L97 PentiumII 440LX MB w/AGP Port
*64MB SDRAM 12ns
*3.5GB UltraDMA/33 Hard Drive
*Asus V3000 AGP Video Accelerator 4MB
*17" SVGA Monitor 1280x1024
*Teac 1.44MB Floppy Drive
*Keytronic 104 Keyboard
*Microsoft mouse w/ pad
*24X EIDE Internal CDROM
*Creative Lab AWE 64 Sound Card
*Altec Lansing Acs40 2 way Speaker
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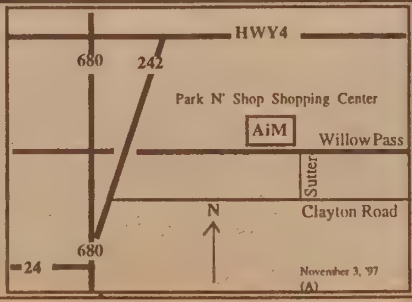

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IDE/IO	Yes	No	No	Yes	Yes
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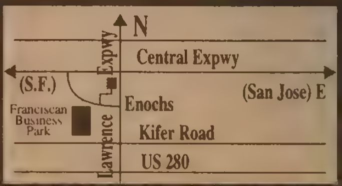

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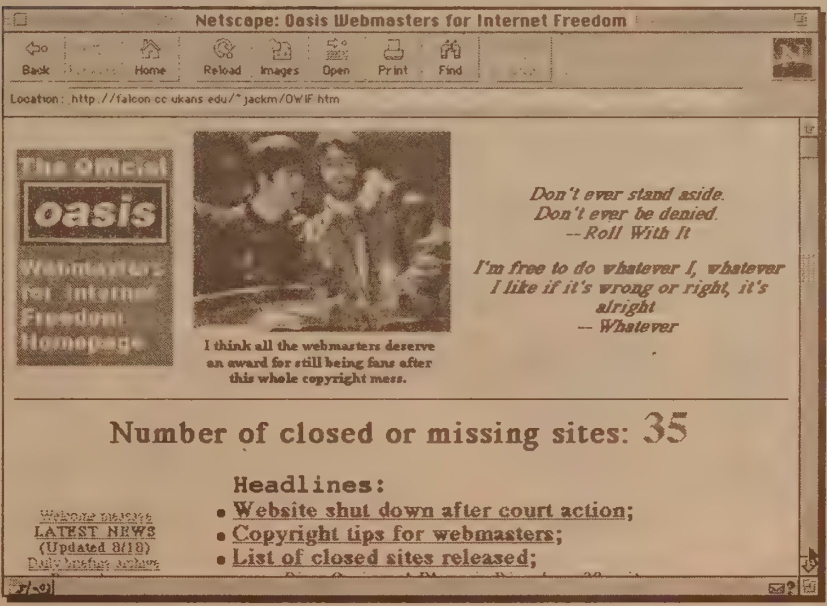
Intellectual Property In The Brave New Digital World

Creativity And Techno-Marxism On The Internet

By Ivars Bezdechi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Daily briefing archive

Location: http://falcon.cc.ukans.edu/~jackm/OWIF.htm

I think all the webmasters deserve an award for still being fans after this whole copyright mess.

Don't ever stand aside.
Don't ever be denied.
--Roll With It

I'm free to do whatever I, whatever
I like if it's wrong or right, it's
alright
-- Whatever

Number of closed or missing sites: 35

Headlines:

- Website shut down after court action;
- Copyright tips for webmasters;
- List of closed sites released;

The "Oasis Webmasters for Internet Freedom" successfully protested against the popular band's decision to fight unauthorized use of their material.

It used to be so simple.

When someone would write a book, compose or record a musical piece, create a painting, or produce a motion picture (or in legalese, produce an "intellectual property"), the creator would register the work with the US Library of Congress, and he or she would be the legal owner of the work. As a result of this flurry of paperwork, nobody else could claim ownership of the created work, and if somebody wanted to use it in the creation of another work, the original author would have to be compensated for the use of the work, or in the least, receive some sort of acknowledgement.

In more specific terms, copyright laws give to the author (or the owner of the copyright) the sole and exclusive right to reproduce the work "of tangible expression" in any form, for any reason. Before a copyrighted work may be printed, broadcasted, dramatized, or translated in any form, the permission of the copyright owner must first be obtained.

But with the continuing explosion of the digital technologies and the brave new world of the World Wide Web, the whole question of intellectual property is being turned upside-down and inalterably changed forever. Making things even more confusing are those (sometimes referred to as "techno-Marxists") who argue that copyrights (in a sense, private property) should be completely abolished because they harm society by preventing the free flow of information. On the other side of the coin, it has been successfully argued and set into practice that protecting the rights of an author encourages other authors and artists to write and publish and create original works.

The Gutenberg Effect

There were very few questions about who owned an original literary or artistic work and who had the rights to publish it before the invention of the mechanical printing press. Manuscripts were hand-copied by a copyist, and were "protected" by the law of personal property. But when exact copies of these manuscripts began to be mass-produced and distributed, the printing press not only produced a piece of physical property (the book itself), but created an arrangement and organization of words and ideas—or "immaterial" property. This "immaterial property" was now considered to be "literary property" and was not protected by British law.

Eventually this led the British government in 1518 to create an organization of master printers, chartered by the government to control, regulate and protect printing. These printers were required to record the publications they printed in a registration book which later could be used as evidence in litigation over printing privileges, as registration of a publication was regarded as a substantiated claim of evidence of ownership. Over two hundred years, the scope of these British laws was broadened as authors demanded to receive additional compensation if a particular book sold well, and if all rights were not sold to a printer for a single fee.

While US copyright laws have their roots in British law, the colonies did not have a separate copyright statute, and printing and publishing original books and pamphlets was not

continued on page 130

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- Heat Sink & CPU Fan
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- Intel Triton Chipset w/256K Pipeline Cache
- 1.44MB Floppy Drive
- Enhanced IDE w/16550 I/O
- Tower or Desktop Case w/Power Supply
- 104 Enhanced Keyboard

586 Pentium®

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150MHz	$290

- Intel Pentium® CPU
- Heat Sink & CPU Fan
- 0MB Expandable to 128MB on Board
- Intel Triton Chipset w/256K Pipeline Cache
- 1.44MB Floppy Drive
- Enhanced IDE w/16550 I/O
- Tower or Desktop Case w/Power Supply
- 104 Enhanced Keyboard

586 Pentium®

133MHz	$290
120MHz	$290

- Intel Pentium® CPU
- Heat Sink & CPU Fan
- 0MB Expandable to 128MB on Board
- Intel Triton Chipset w/256K Pipeline Cache
- 1.44MB Floppy Drive
- Enhanced IDE w/16550 I/O
- Tower or Desktop Case w/Power Supply
- 104 Enhanced Keyboard

**Prices do not include Hard Disk, Display or RAM*

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2.1GB	$170	4.3GB	$275

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180MHz	$500

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- Intel Venus Motherboard
- 256K CPU Cache
- Heat Sink & CPU Fan
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- Enhanced IDE w/16550 I/O
- ATX Mid-Tower Case
- 104 Enhanced Keyboard

MMX 686 Pentium® II

300MHz	$1220
266MHz	$920
233MHz	$850

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- 512K CPU Cache
- ASUS or Intel Motherboard
- Heat Sink & CPU Fan
- 0MB Expandable to 128MB on Board
- 1.44MB Floppy Drive
- Enhanced IDE w/16550 I/O
- ATX Mid-Tower Case
- 104 Enhanced Keyboard

K6 AMD

233MHz	$540
200MHz	$380
166MHz	$320

- AMD CPU
- Heat Sink & CPU Fan
- 0MB Expandable to 128MB on Board
- Intel Triton Chipset w/256K Pipeline Cache
- 1.44MB Floppy Drive
- Enhanced IDE w/16550 I/O
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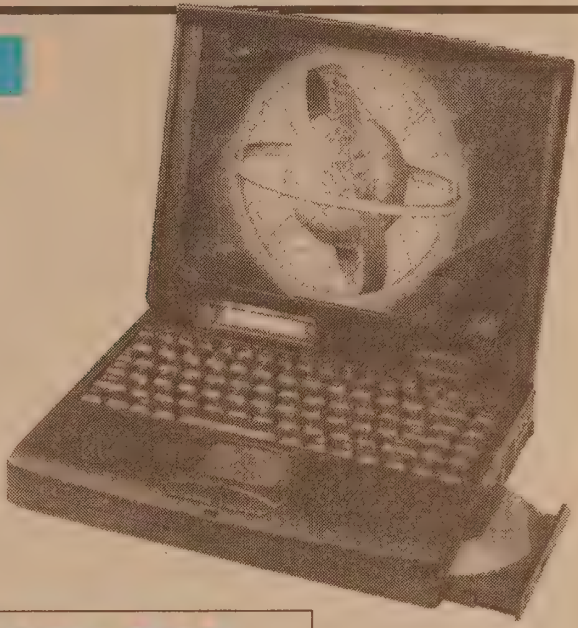

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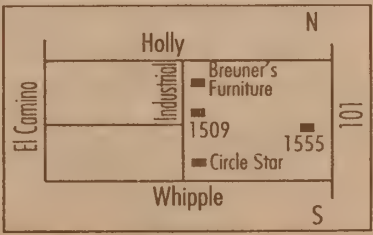

an active business prior to the American Revolution. After the Revolution, British law no longer was applicable.

As the American founding fathers had bigger problems to contend with at the time, it was only after the adoption of our present Constitution in 1789 did the rights of authors begin to be protected in Article I, Section 8, "The Congress shall have the power...To promote the Progress of Science of useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

Over the years, various amendments to the original law were made enumerating specific protections for books, photography, fine art, culminating with a major revision in the law which was enacted in 1909 to include sound recordings. Reflecting the change in technologies, current copyright laws were adopted in 1976.

Right Here, Right Now

If any one medium has forced the entire question about intellectual property to the forefront, it has undoubtedly been the World Wide Web. Electronic publishing tools—a computer, a layout program and a good quality printer—have empowered millions to co-opt A.J. Liebling's assertion that "freedom of the press is for those who own one," and Mr. and Mrs. Joe Sixpack, armed with a computer, scanner and a modem, are becoming publishers too.

While their contributions to the information infobahn have on the most part been innocuous, what is raising the hackles of some media providers is their belief that they are slowly but surely losing control of their information and "intellectual property" as fast as they can post it on the Web.

Their main complaint is that if you can't photocopy a book and distribute it without breaking copyright laws, nor can you print a photograph taken by a professional without permission, nor can you tape a movie on your VCR and resell it, then why should you be allowed to cut and paste text and photos from the World Wide Web for commercial use?

On one level, electronic photo-editing programs such as Adobe Photoshop now offer encryption schemes which allow the embedding of transparent "digital watermarks" within an image to identify its owner. The bigger picture, viewed with a healthy dose of concern by corporate America, emerges when Mr. and Mrs. Joe Sixpack use commercial materials on their private Web sites.

In a highly publicized move, the British rock group Oasis fired the first salvo last May when the management of the group sought to halt the unauthorized use of copyrighted material on more than 100 sites devoted to the band. The controversy started when the Webmaster of Oasis' home page "OasisNet" sent an email message to the "unauthorized" Web sites, stating in part that "Webmasters are in danger of legal action if copyrighted material is not removed from their sites. Internet Service Providers housing illegal material will be asked to terminate accounts or face action themselves."

But after a firestorm of protest which included a "union" of "Oasis Webmasters for Internet Freedom," (*http://falcon.cc.ukans.edu/~jackm/OWIF.htm*) Oasis backed away from their initial statement, retreating to a more relaxed position of not discouraging the fan Web sites; instead, they voiced their displeasure by stating, in part: "There are a number of sites out there, who, to be frank, we feel have taken advantage of the situation."

In view of the brouhaha, Oasis' record label, Sony Music, has decided to take an even-handed approach to the question. While Sony Music's vice-president/general manager of new technology and business, Fred Ehrlich, was out of the country and not available for direct comment, a spokesman for Ehrlich provided a statement to the *Hollywood Reporter* entertainment industry trade journal regarding the issue: "In regard to the question of how he will handle the use of or misuse of fan Web sites in the future, we encourage the creation and use of Web sites—the very fact that fans spend the time and effort to create them is a tribute to our artists. At the same time, we want to protect both our artists and our intellectual property."

The main concern of late for the music industry seems not to be unauthorized fan Web sites, but rather the so-called "digital jukeboxes" Web sites, sometimes referred to as the 1990s equivalents of the pirate radio stations that pumped out pop music from North Sea ships in the 1960s.

The main concern of late for the music industry seems not to be unauthorized fan Web sites, but rather the so-called "digital jukeboxes" Web sites, which are sometimes referred to as the 1990s equivalents of the pirate radio stations that pumped out pop music from North Sea ships in the 1960s. These Web sites release music over the Internet in the form of MPEG3, near-CD-quality, digitally compressed audio files which can be downloaded free-of-charge onto home computers. Although they do not make money, they are breaching copyright by distributing songs without the record companies' permission. The Recording Industry Association of America recently took a tougher stand on the Web sites by filing suit against three unauthorized Internet "digital jukeboxes."

Fox Broadcasting also entered the fray when it recently responded to "erroneous rumors circulating on some Internet Web sites" that it was not the intention of the TV network to shut down bona fide Web sites created by fans devoted to their popular TV shows "The X-Files," "Millenium," and "The Simpsons." Although Fox Broadcasting attorneys would not speak on the record regarding the subject, they emphasized through a prior issued press statement that Fox requires all Web sites using copyrighted and trademarked materials to comply with guidelines that protect the creative integrity of the programs they create.

"Fox has not asked any Web sites to be closed, except a few which were using program materials in an inappropriate manner." ("Inappropriate manner" in Fox's view includes several common copyright no-nos such as the use of copyrighted photographs, images and sounds which have not been approved for distribution, removing Fox's copyright and trademark notices, copying or altering text, photographs, or using Fox's property not directly associated with the programs.)

Despite trying to walk a thin line between protecting its intellectual properties and not antagonizing overzealous fans, industry leaders generally agree that the entertainment companies want to have a sense of control over their properties. They're trying to be careful that they don't establish a precedent in allowing copyrighted materials to haphazardly appear on the Web.

The Sky Is Not Falling

For Los Angeles-based entertainment law attorney Ivan Hoffman (*home.earthlink.net/~ivanlove/internet.html*), the whole question of copyrights in a digital world is one where "at the inception of any new medium, those in the already existing media are heard to cry about the

continued on page 222

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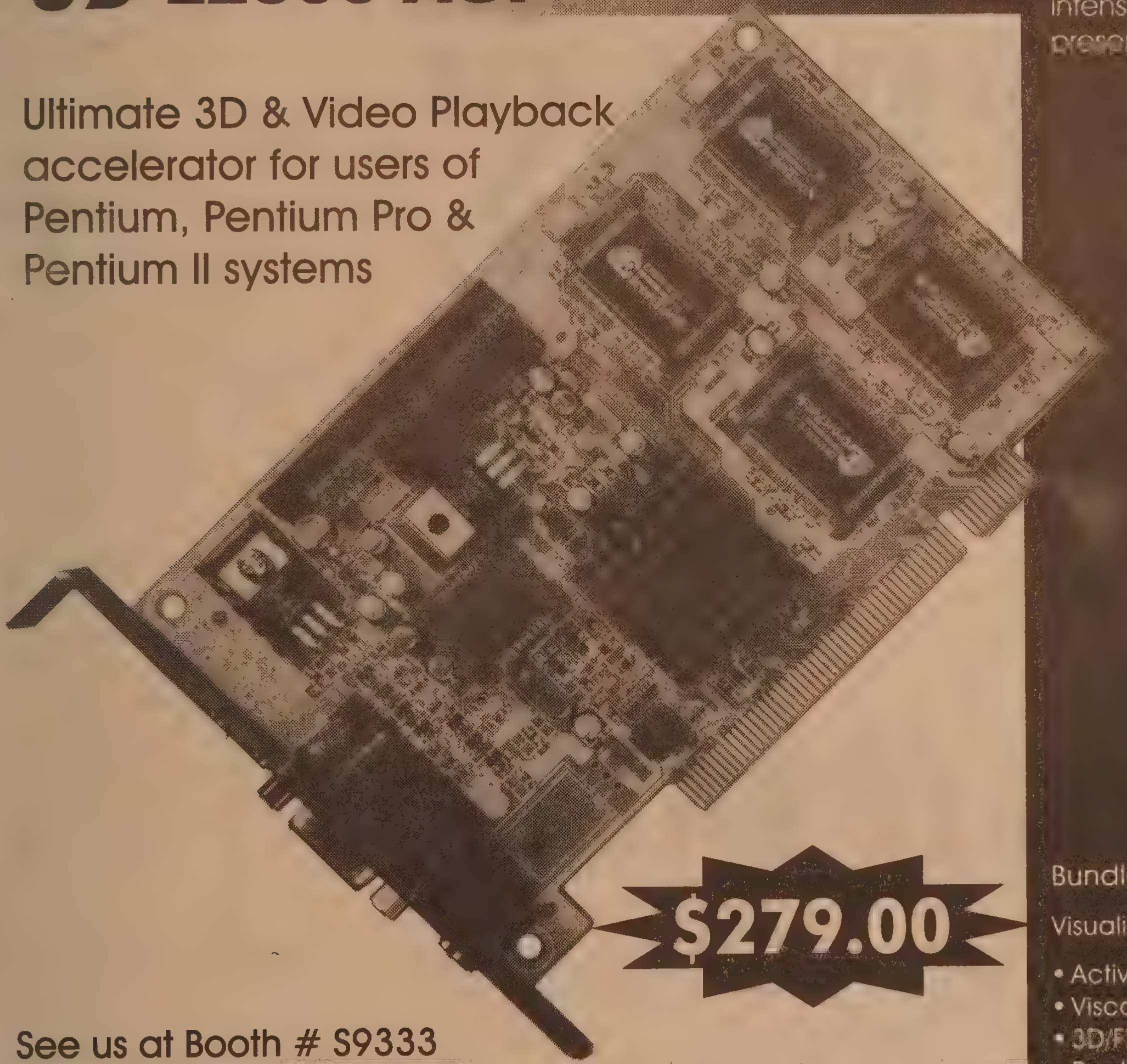

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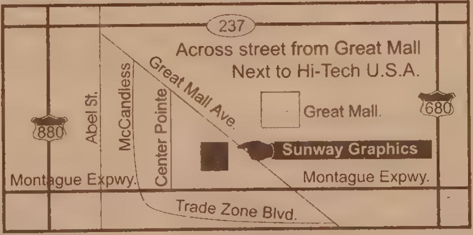

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BMUG • By Peter Linde and Sam Penrose

Viruses: They're Back, They're Bad...

Plus: Drive Organization Tips

This month, Peter will talk about the scourge of a new class of computer viruses, and Sam will cover the finer points of hard drive organization.

The Plague

By Peter Linde

There was a time, not long ago, when the world was different.

Mac users exchanged files, even programs, with nary a care. Floppies were passed back and forth between computers, and anti-virus software was seldom seen on Macintosh computers. Although the threat of computer viruses has been with us for almost as long as computers themselves, viruses were extremely rare on the Mac side until recently. When viruses did pop up, they were usually pretty tame and only rarely (intentionally) data destructive.

This is in direct contrast, by the way, to the DOS and Windows world, in which there are literally thousands of viruses. A great many of them are designed to scramble or erase your data. It is easier to program viruses for PCs, so it seems that most of the losers who do so, happen to write them for the platform of their choice. Draw your own conclusions....

There are still fewer than twenty of what I'll call traditional viruses that affect the Macintosh. Traditional viruses are passed by exchanging programs or system files with other computers. They are never spread by documents, although they can be spread by the floppies that are used to share those documents. Although some infect documents, it is much more common that they infect system files and/or applications. This is because most traditional viruses need to be able to execute code, either when a program is run or at startup. Most of the traditional viruses for the Mac are designed to simply spread themselves rather than to destroy data.

That Was Then....

But Macs no longer enjoy relative immunity to annoying and destructive viruses.

Why? Mac users (as well as those on the PC side) have Microsoft's Visual Basic to thank.

Visual Basic (VB) is a relatively powerful programming language that is built into both MS Word (6.0 and later) and MS Excel (5.0 and later). It is there so that people can create macros (helpful mini-programs) that perform repetitive tasks at the stroke of a key. It is also possible, with Visual Basic, to create complex programs that can manipulate data in many useful ways. No one you know is likely to do this.

VB installs by default, even though most people will never use even a single macro. Visual Basic is designed to allow one to write cross-platform macros. Therefore it makes it easy for malicious miscreants to write cross-platform viruses. Many Word Macro Viruses are clearly written to wreak havoc on PC systems, and, although they can spread to and through Macs, cause little or no damage to them.

But there are quite a few that do damage files, lose data, waste time, and cause plenty of frustration. One Word Macro Virus scrambles the words in your documents each time you open and save. Another adds an anti-nuclear testing message to the end of your documents if you happen to print it during the last few seconds of each minute. Some don't do much of anything. But they all spread, and the terrible part about it is that they spread via Word documents rather than via the Word program itself. This is important—it means that they are much more contagious than most traditional viruses.

While few are likely to copy a large program like Word from one computer to another, workplace collaboration all but demands that documents be passed back and forth among multiple users. Each infected document has the potential to infect each system on which it is opened, which in turn, can then infect all systems with which it shares documents.

How serious is the problem? Before Word 6 burst its corpulent way on to Mac screens, new Mac viruses cropped up no more often, on average, than once or twice a year. Now, according to the Department of Energy's Computer Incident Advisory Capability (CIAC), more than forty Word Macro Viruses are appearing each month. More than two-thirds of the virus incidents being reported to the CIAC involve Word Macro Viruses. (See the end of this month's column for a list of anti-virus resources on the Net).

This means that we all need to be far more careful about viruses than we ever were before. Everyone who uses Microsoft products (and sadly, that's pretty much all of us, right?) needs to be aware of this problem and the current solutions to combat it.

First off, Microsoft released a set of macros called Scanprot.dot that provide you with a warning every time you open a Word document that contains any macros. Scanprot gives you the option to open the document minus its macros. The idea is that if you get a warning, and you weren't expecting any macros to be associated with a document, you should open the document without the macros until you can be sure that the macros are neither infectious nor malicious.

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Scanprot can't differentiate between good and bad macros, and if you double-click on a document rather than using the Open command under the File pulldown menu, it doesn't work at all. All in all, it's not a great solution. But it is worth installing.

Who Will Save Us?

Before the days of Macro Viruses, I used to tell my clients and folks who called the BMUG Helpline that they didn't really need to worry about having anti-virus software installed. In eight years of consulting, I have only found 5-8 traditional viral infections in the wild. For the last year, I'd estimate that we encounter that many Macro Virus infections each month among our clients.

Everyone should get anti-virus software, and they need to religiously download and install the monthly updates from the Web site of whatever anti-virus software maker they choose. My current favorite for the Mac is Virex, but it swings back and forth—both Symantec and Virex have made mistakes with their virus definition updates recently. This has resulted in data being trashed in the course of virus removal. Both of them seem to have cleaned up their act, but they are having trouble keeping up with the flow of new Macro Viruses.

In sum, Macro Viruses present a real danger for Macintosh data. Your only hope is to protect yourself before you get caught by one. Get a commercial anti-virus product (the freeware Disinfectant can not detect Macro Viruses), install it, and keep it updated. In my next regular column, I'll talk about the other important data savior: Back up.

Three other important notes on computer viruses:

1) No virus can harm your machine just from your reading a piece of email. If you have been on the Internet for any length of time, you may have received a warning from a well-meaning friend or associate about any number of viruses that claim to erase your hard drive if you just open and read a piece of email. The first of these hoaxes was called Good Times, as that was the subject line of the email that was supposed to cause all the damage. The so-called Good Times virus was even supposed to be able to damage your hardware! This brings us neatly to point number two:

2) No computer virus can damage your hardware. While they might be able to add wear and tear to your hard drive, they cannot, by themselves, physically damage your equipment.

3) If you think you have discovered a new virus, or, if someone sends you a dire warning about a new virus, before you pass that warning on to everyone in your email programs address book, please check the CIAC Web site, or one of the other anti-virus information sites (listed at the end of this month's column). Some people seem to like to spread fear by creating hoaxes of this type.

Using The Finder More Effectively

By Sam Penrose

The Macintosh has had one face, called the Finder, for the last thirteen years.

So simple that even an adult could use it, the Finder seemed revolutionary in 1984. Its apparent elegance was preserved by the fact that you couldn't make much of a mess on a tiny 400K floppy.

Visual Basic is designed to allow one to write cross-platform macros—**making it easy** for malicious miscreants to write cross-platform viruses. There are quite a few that damage files, lose data, waste time, and cause plenty of frustration. One Word Macro Virus **scrambles the words in your documents** each time you open and save.

Today's multiple-gigabyte hard drives with their thousands of files can get into quite a state. Many third-party utilities offer to help with housekeeping, but they usually cost money, always take up RAM and drive space, often cause conflicts, and occasionally need updating. A more graceful solution is to make more effective use of the powerful software you already have: the Finder. This month we'll look at how one person keeps a hard drive organized using some Finder features: folders, aliases, the Apple menu, and PopUp windows.

Folders

Folders may seem like old hat, but not everyone uses them effectively. Let's say that, like some of my friends, you have to scan dozens of little names and icons on your desktop and the top level of your hard drive in order to find anything. You want your files to be simultaneously less visible (out of the way) and more visible (easier to find).

You need a good set of folders. Getting files out of the way is easy: The first command in the Finders File menu, New Folder, will generate as many folders as you want.

Before you start willy-nilly dragging files into folders and folders into other folders, you should think about what sort of structure you want to give your folders, so you can find everything next week. That structure should reflect what the files are and how you use them.

Consider my drive as an example. Most days I connect to Planet BMUG and the Internet, write with ClarisWorks, and read text files with BBEdit Lite. My folder structure is determined accordingly. The first level of my drive has a folder with the icons for my on-line programs and BBEdit Lite, called "Apps," a folder for downloads, called "Telecom," and a folder for my writing, called "Writing." (My Mac automatically puts the System Folder there as well.) As a result, I can get to the files I use all the time very quickly, while maintaining a logical order.

The rest of them belong in a final folder, called "Etc." In it, I have subfolders for games, utilities, random information, ClarisWorks, literature sent to me by my on-line friends, and system software detritus. Note that I don't download directly to those folders, dumping files in Telecom instead. Periodically I go through Telecom and clean out everything that has grown stale, dragging only files with lasting value to the subfolders in Etc. If I saved directly to the subfolders I'd have to go through each of them, which means in practice that the amount of junk on my drive would soar.

This folder structure has evolved over time, and it certainly wouldn't be perfect for you. Try experimenting with different sets of folders; it's as easy as point-and-click.

Aliases

An alias is a pointer to a file, created via the Make Alias command just below New Folder. If you tell your Mac to open an alias, it will open the corresponding file.

continued on page 142

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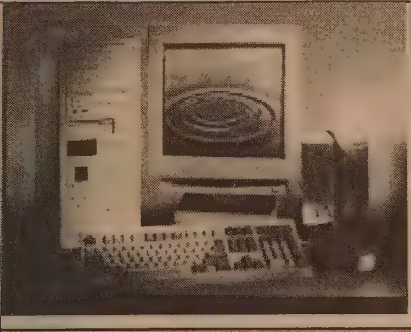

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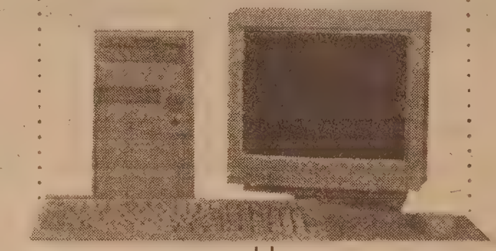

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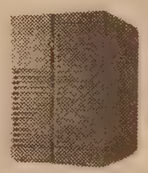

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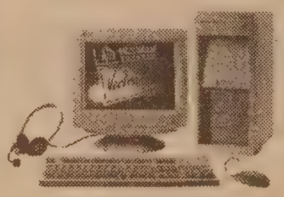

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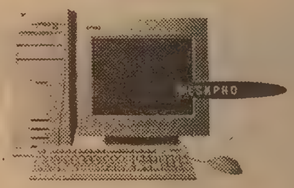

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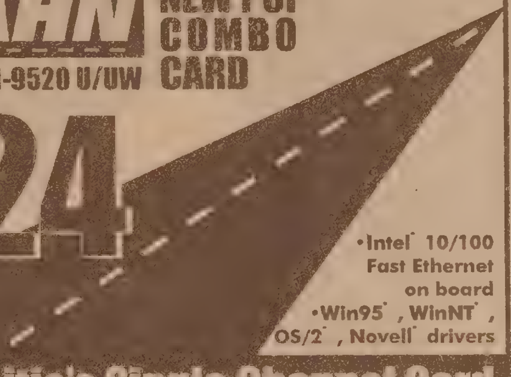

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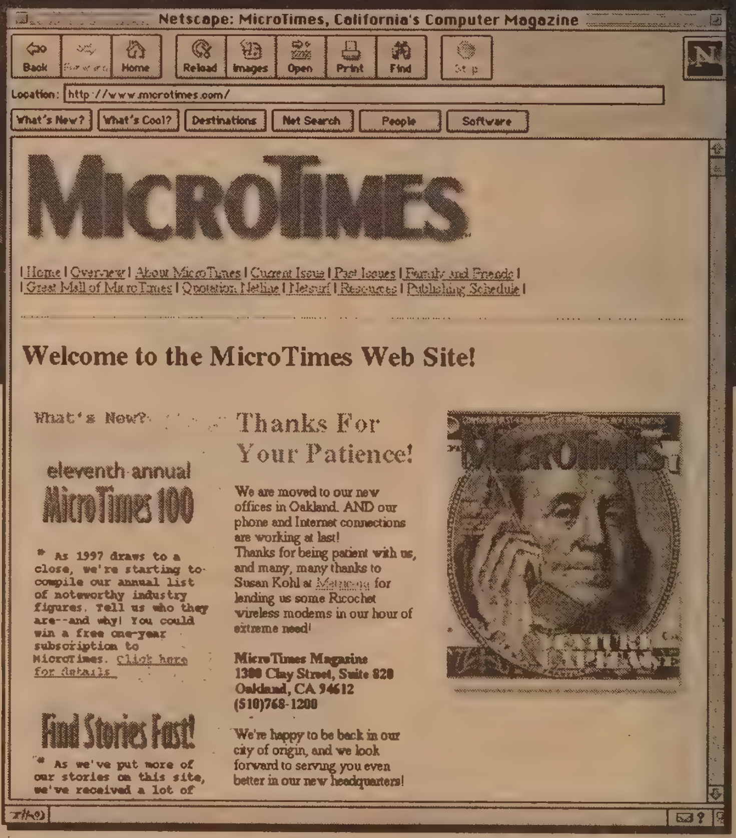
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continued from page 134

This powerful tool allows you to leave your folder structure intact while putting pointers to your files anywhere you please, making them much more accessible. Rather than putting actual programs in my Apps folder, I use aliases. That way I can leave the programs with their support files in the proper folders while keeping them accessible from a single prominent location.

Aliases are wonderfully robust. When I save a Web page as text within Internet Explorer, Explorer marks it with its own creator type. The next time I go to open it, my Mac dutifully loads Explorer, which takes time and RAM. Worse, Explorer doesn't display its own text files properly! (Earth to Microsoft...) So I keep an alias of the excellent BBEdit Lite handy. Any text file on my drive can be opened and properly displayed in a snap, just by dragging it over that alias. Such elegance reminds you why people love the Mac.

> In sum, Macro Viruses present a real danger for Macintosh data. **Your only hope is to protect yourself** before you get caught by one.
> Get a commercial anti-virus product (the freeware Disinfectant can not detect Macro Viruses), install it, and keep it updated.

The Apple Menu

All programs that have Menus share the Apple menu. By putting files or their aliases in the Apple Menu Items folder in your System Folder, you can make them universally accessible without having to go through the Finder.

I find the most powerful uses of this feature to be indirect. Rather than filling my Apple Menu with a handful of set choices, I use the Recent Items and submenus features of the Apple Menu Options Control Panel (introduced with System 7.5) to accomplish much more. Recent Items keeps aliases of the last applications, files, and servers you accessed in separate Apple Menu folders. Submenus (or "cascading" menus) make those aliases available from within the Apple Menu when you select one of the Recent Items categories. Since the next file you want is quite likely to be one of the last files you opened, having them a click away via these features is extremely handy. It also means you don't have to leave them cluttering your desktop.

Even better, if you put an alias to your hard drive in the Apple Menu Items folder, every file in the first four levels of your drive will be available via a single cascading menu choice from the Apple Menu.

By putting a space or other non-alphabetical character in front of the drive name in the alias, you'll move it to the top of the Apple Menu for maximum ease. I use this trick many times a day. It saves me from having to manage a bunch of open folders on my desktop.

Apple Menu Options is not without its drawbacks. It has been blamed for a large number of software conflicts, and the drive alias trick

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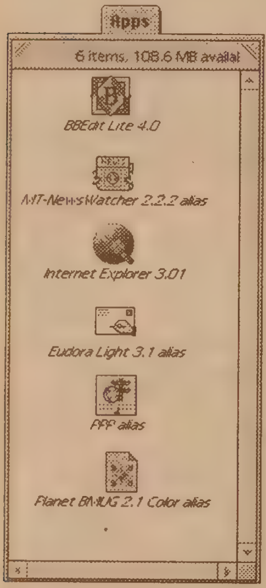
reportedly interrupts startup while Apple Menu Options makes a list of all those files. My Mac is extremely stable and I don't notice the startup hit, but your mileage may vary.

PopUp Windows

If you've installed MacOS 8, there's another way to access hidden files quickly: PopUp windows. You can see them at the bottom of my desktop in the screenshot nearby. When you drag an open folder window to the bottom of the screen, the Finder changes it to a PopUp window.

PopUp windows stay out of the way until you click on the name. Then they pop open so you can get at what you need and snap closed after you've got it. Ninety percent of my Mac use involves writing, using communications software, and accessing files I've downloaded or saved with my communications software. I use the Finder's View menu to display the Writing folder "as List/Arrange by Date Modified." (I do the same with the downloads in the Telecom folder.)

That way, when I got up today to continue last night's work on this column, it sat at the top of the folder. To start my next project, rather than opening the ClarisWorks application file I'll just pop up the Writing folder and open the ClarisWorks stationery file I keep there. (In many applications, once you have a new document formatted the way you generally prefer, you can skip having to redo the formatting next time by clicking "stationery" in the "Save As..." dialogue.)



Rather than putting actual programs in my Apps folder, I use aliases. That way I can leave the programs with their support files in the proper folders while keeping them accessible from a single prominent location.

The aliases in the Apps folder get displayed differently. They never change, and there are only a few of them, so Icon View makes more sense. The icons are placed in the order I generally use them from bottom to top (since I have to click at the bottom of the screen to pop up the window). The BBEdit icon is most frequently accessed by dragging a file to it. Since PopUp windows open gradually when you drag something over them, it stays at the top of the Apps window, right where a text file dragged over the Apps tab will land over it.

Find Your Own

We have hardly exhausted the Finder's feature set, and these examples are not models for everyone. But the next time someone tries to sell you a $100 utility for organizing your files, you might want to ask yourself whether a more powerful and elegant solution isn't staring you in the face every time you sit down to work on your Mac. ■

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Anti-Virus Resources On The Net

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URL: *http://ciac.llnl.gov/*
(Here you will find descriptions of all known viruses, bulletins about recent discoveries as well as links to other sources of information on computer viruses).

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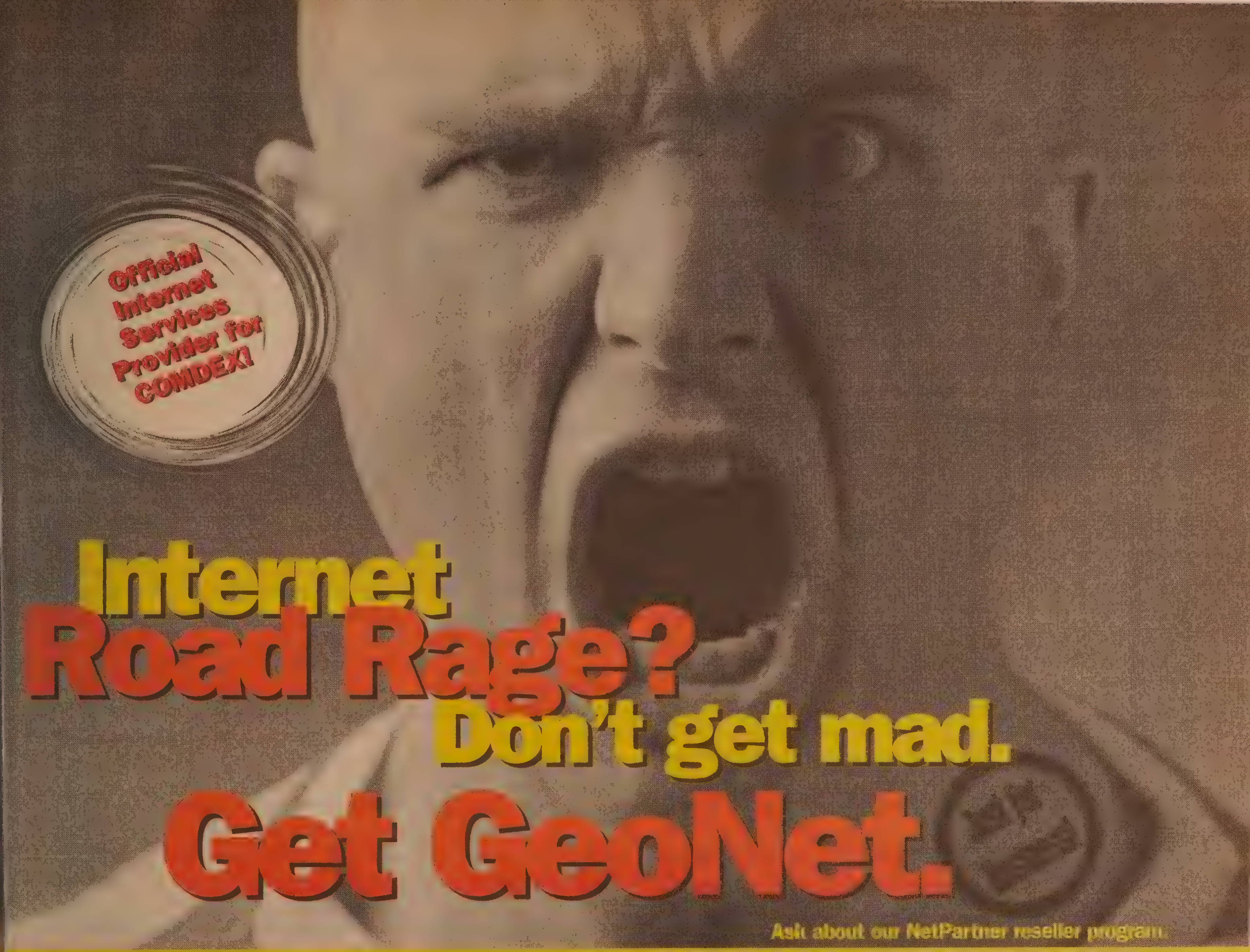
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COMDEX/Fall '97, the world's largest business-to-business event for the information technology (IT) industry, attracts over 210,000 resellers and corporate decision makers and 2,100 exhibiting companies. Over 100 conference sessions led by industry leaders are scheduled to provide you with the latest information in key areas of IT.

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Conference

- **Technology Conference** Focusing on strategies and solutions for the Internet/intranet/extranet, enterprise computing, development tools, and more.
- **SuperSessions: High-Tech Show 'n' Tell** Taking you beyond discussions into the real world of high-tech.
- **PowerPanels: Insights from Insiders** Featuring top executives from the companies that are moving the industry.
- **InFocus** Comprehensive overview of key industry trends, companies and technologies.
- **EXPO COMM Communications: IT Infrastructure Solutions** Building systems for global connectivity. Co-developed by The LIDO Organization.
- **Venture Forum** The premier guide to IT investing. Produced in association with *The Red Herring*.
- **Converging Channels Program** New opportunities for resellers and mass-merchandisers. Produced in cooperation with CMP Channel Group.
- **International Marketing Forum** An overview of new global business opportunities.

Debuting at COMDEX

PL513 Diskless LAN Station

PRIMETECH SYSTEM INTEGRATION HAS ANNOUNCED A NEW UNIT FOR NETWORK SOLUTIONS, the PL513, a book-sized Pentium processor-based PC that combines integrated networking and communications to provide you with a PC that is small, fast and powerful. The PL513 utilizes unique software which allows it to run numerous operating systems such as DOS, Windows 3.1 and Windows 95 without a hard drive or a floppy drive off of a Windows NT or Novell server. The high-performance CPU and 256KB pipeline burst Level II cache, with up to 128MB of EDO memory, provide the extra processing power you need for today's demanding business and multimedia applications. Because the unit is only slightly larger than a book, this new technology saves space, and, because fewer components are needed for the system, it saves money. Without a storage device on board, security is less of an issue, because no files can be corrupted or removed. With its 32-bit 10bast TLAN card, the system can perform a vast array of data transfer and networking tasks. The system comes with an RJ45 jack to connect to a LAN network, PS/2 keyboard and mouse ports, one serial port, one ECP/EPP-capable parallel port, one IrDA interface for easy infrared data transfer, one VGA connector, one ISA slot and one shared ISA/PCI slot. For further information please contact Primetech Systems Integration, 2308 Tripaldi Way, Hayward, CA 94545; (510)670-1700.

Exhibits

To help facilitate your show experience, the show floor will be divided into dedicated Technology Areas. These areas focus on specific IT categories, enabling decision makers to see the exhibits of interest to them. Each area is supported by specialized conference sessions highlighting technology advances and marketplace trends.

- **Internet** It's now the industry's premier launch pad for new Internet/intranet/extranet products, including development platforms, Internet telephony, firewalls, electronic commerce and much more. What's the future of Java? Find out here.
- **Network Computing** Find the newest NC models, along with networking products extending the desktop's power. Also throughout the exhibit floor—servers and other networking storage and delivery solutions.
- **Communications** The IT industry demands more from communications equipment and applications—from routers that run multimedia apps more effectively to network-enhanced and delivered apps such as groupware, development tools, and server software.
- **Multimedia** Hot new chips and technologies combined with the Web, server and database advances—all push networked multimedia to the forefront of PC sales and create new tools for corporate commerce.
- **Digital Consumer Technologies** The ability to digitize content (voice, video, or data) will radically alter the way people communicate, conduct business, and entertain electronically. See how convergence market technologies are adapting to enhance business computing and vice versa.
- **Microsoft Partner Pavilion** View the next wave of applications, custom solutions and hardware platforms from some of Microsoft's leading partners.
- **IrDA Pavilion** In cooperation with the Infrared Data Association. Experience

first-hand the latest IrDA-enabled devices, software, solutions and components in a dedicated selling area.

- **Universal Serial Bus Pavilion (USB)** Get on the Bus—and get a look at the technology of the future as USB vendors exhibit their plug-and-play peripherals.
- **OEM Pavilion** Sponsored by IBM Microelectronics. From sourcing and vendor activity to OEM advances in networking, communications and digital consumer technologies.
- **Linux Pavilion** Your single source to research, find, and test-drive the latest products and technologies for this powerhouse 64-bit operating system.

Keynotes

Bill Gates

Chairman and CEO
Microsoft
Sun., November 16

Gates will present a first-of-its-kind keynote address Sunday, November 16, at 7 pm, as a prelude to the opening of the COMDEX/Fall exhibits on Monday morning.

Eckhard Pfeiffer

President and CEO
Compaq Computer
Mon., November 17

Creating A Customer Value and Productivity Revolution In A New Age Of Computing

Pfeiffer will look at what the industry as a whole needs to focus on to bring more of the benefits of computing to more people—at work, on the road, and at home. He will give special attention to Compaq's leadership role in advancing a new computing model that combines open standards-based computing with a horizontal market model and the most efficient model of distribution in the PC industry.

John T. Chambers

President and CEO
Cisco Systems
Tues., November 18

The Internet—Changing the Way We Live, Work, Play and Learn

Once the domain of only technical experts, networking and the Internet are today affecting your business, schools, hospitals, community, and home. Chambers will discuss how this powerful technology has created a new business model. He will share how a network-enabled approach to running a business is saving companies millions of dollars while giving them a competitive edge. He will also explore the benefits and changes that networking and the Internet are bringing to medicine, education and the community. Today we can't imagine our lives without the telephone. In the future we won't be able to imagine not having access to the Internet.

Dr. Eric Schmidt

CEO
Novell, Inc.
Wed., November 19

Schmidt's keynote will mark his first appearance at COMDEX since taking over the reins at Novell in April as chairman of the board and CEO.

Registration & Information

Register online: *http://www.comdex.com*

Register by mail: Mail the registration forms contained within attendee brochures to: Registration Department, 300 First Ave., Needham, MA 02194-2722.

Register on-site: You can register on-site on the day before the show (if available) as well as on any show day.

Registration Support Department: (781)449-2674

COMDEX Conference Hotline: (781)433-1650 ■

Debuting at COMDEX

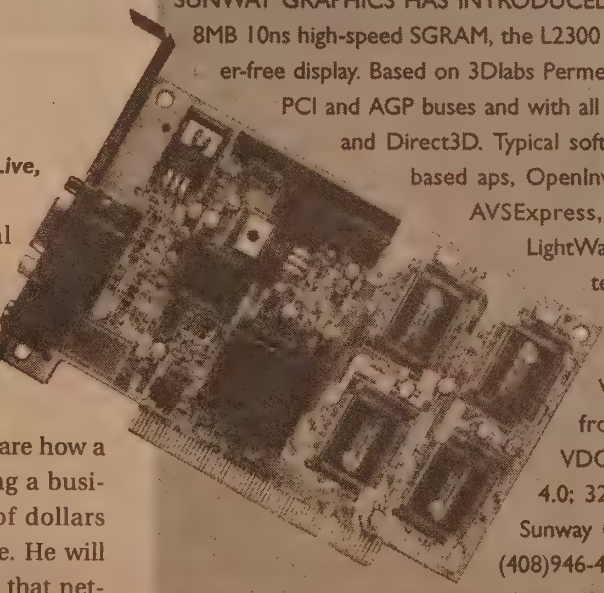
PolyAlpha 600 Series

POLYWELL COMPUTERS HAS ANNOUNCED THE RELEASE OF its 600MHz Alpha-based workstation, the PolyAlpha 600, which is built with two 64-bit PCI, two 32-bit PCI and two 16-bit ISA Bus slots based on the 600MHz Digital Alpha 21164 RISC processor. Polywell has designed two models of the PolyAlpha 600; one is the 600E based on an IDE disk subsystem in mid-tower configuration, the other is the 600A based on a SCSI disk subsystem in full-tower configuration. The PolyAlpha 600 models support up to 1GB ECC 168-pin SDRAM running at 83MHz and 128-bit path I/O with four DIMM sockets. The PolyAlpha 600 series also has 16K Level 1 and 96K Level 2 internal processor cache, plus 2MB synchronous SRAM as Level 3 external cache. The system motherboard is in a standard ATX form factor with two serial, one parallel, PS/2 mouse and keyboard ports. On-board two enhanced IDE and one floppy adapters are standard. Polywell also offers a 533MHz version of both models; other custom configurations are also available. For more information, contact 1-800-999-1278, *sales@polywell.com* , or URL: *http://www.polywell.com* .

DANGEROUS CREATURES

Debuting at COMDEX

WinFast 3D L2300



SUNWAY GRAPHICS HAS INTRODUCED THE WINFAST 3D L2300 VIDEO BOARD. DESIGNED WITH 8MB 10ns high-speed SGRAM, the L2300 has a refresh rate of up to 160Hz and offers true color with flicker-free display. Based on 3Dlabs Permedia 2 graphics engine, the L2300 is fully compatible with both the PCI and AGP buses and with all major 3D software standards including 3D API's, OpenGL, Heidi, and Direct3D. Typical software applications include 3D Studio Max, Microsoft Direct 3D-based aps, OpenInventor, Pro/E, I-DEAS, SolidWorks 96, Extreme 3D, TrueSpace, AVSExpress, GameGen II, WorldToolKit and WorldUp, Lightscape, and LightWave 3D. The L2300 is also designed for video playback; its video textures engine ensures high-quality, high-frame-rate video playback and 3D texturing for such uses as video conferencing, DVD, and video editing. The L2300 comes bundled with Visualiser and Viscape from Superscape, ActiveMovie from Microsoft, 3D-FX from Asymetrix, RealiMation STE (demo) from Datapath, and VDOLive Video Player from VDOnet. Designed for Windows 95, NT 4.0; 32MB RAM recommended. $245. For more information, contact Sunway Graphics, Centre Pointe Dr, Milpitas, CA 95035. (408)946-8276, (408)946-4133 (fax), or URL: *http://www.sunwaygraphics.com* .

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	P200MMX	$1569	$1639
	P233MMX	$1709	$1779

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- TV Out Function
- 2-Type II & 1-Type III PCMCIA Slots

Display	CPU Type	1.4GB	2.0GB
14.2" Active Color w/ 16MB & 20X CD-ROM	P150MHz	$3419	$3499
	P166MMX	$3479	$3559
	P200MMX	$3589	$3679
	P233MMX	$3709	$3799

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StepNote MX/Pentium 133 with 12.1" DSTN/1.35GB HDD	1750

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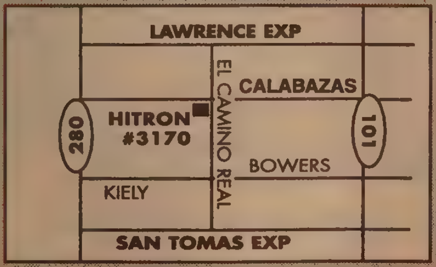

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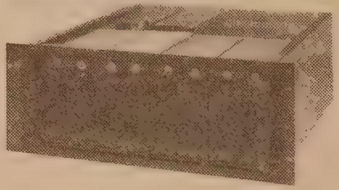

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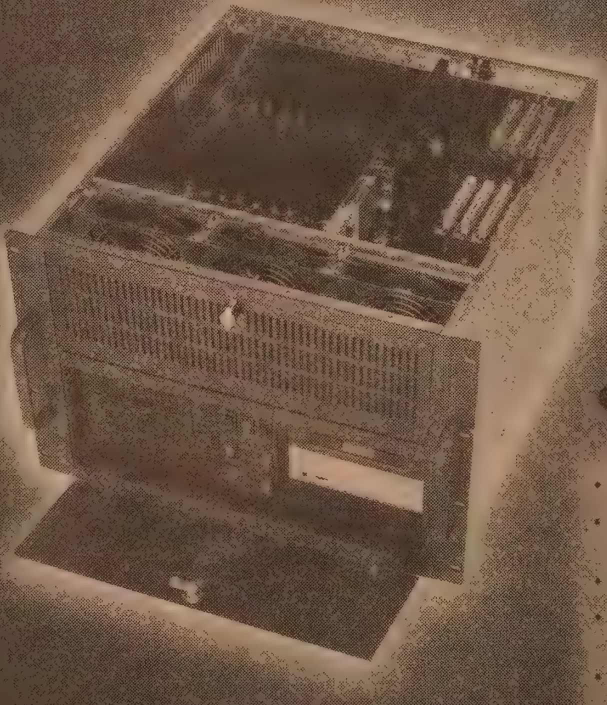

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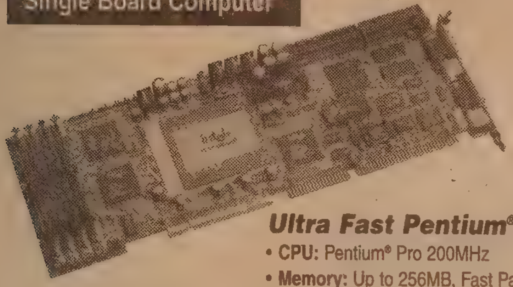

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INTERNET • BY JOHN S. QUARTERMAN

The Domesday Net

William The Conqueror And The Online World

In 1085, agents of William the Conqueror completed the Domesday Book. This was a census of all the new king's domains—so complete it could pass for the one to be used by the Almighty at Doomsday. That book was sign, agent, and herald of profound changes in the history of Britain, Europe, and eventually the world.

William's England

It has been said (by Fernand Braudel, among others) that there were five civilizations in England when William crossed the channel. I'm not referring to Danelaw vs. Wessex vs. Wales vs. Scots vs. whoever else. Not geographical divisions; rather, functional divisions interspersed in the same territory, although not necessarily intermingling in personnel on a daily basis except at their edges.

Perhaps oldest was the arrangement of local lords, peasants, and small villages, in more or less mutually beneficial interaction, with larger and smaller lords, some subservient to others, but for the most part deriving their power from what freeholdings they had collected from the bottom up. This was basically the current version of the ancient agrarian civilization that probably went back to the ice age.

Not as old, but still ancient, was the church, which consisted not only of parish churches and priests or even of cathedrals and bishops, but even more of monasteries, monks, and nuns. It was self-sufficient, holding extensive lands, cloistered from the world, yet powerful in it. On a practical basis, an abbot or archbishop might outrank an earl. What there was of an educational establishment was supported by and embedded in the church.

The state had checkered the landscape in its various sizes. This is where the Danelaw (England had recently been part of a Danish empire that also included Norway and Sweden), Wessex (of which Harold who lost to William was king), and the others come in, with their kings, ministers, treasuries, taxes, armies, and the like.

William brought with him an idea at least as old as Charlemagne that had been more popular on the continent of late: feudalism. This was the hierarchical provision of military service to a higher lord in exchange for a title and accompanying lands and privileges. The image of the mounted knight in armor is familiar to all of us, and is in many ways accurate; it was William's Norman heavy cavalry (the contemporary equivalent of tanks) and related organizational skills that permitted William to conquer England.

Look at the knight's armored foot, which rests in a stirrup. The invention of the stirrup a few centuries before is what permitted a man wearing all that heavy metal to fight on horseback, and thereby increased the cost of fighting equipment to a level that most people couldn't afford. The stirrup created knights, and caused feudalism.

> THE NET MAKES CAPTAINS OF INDUSTRY AND PRINCES OF CAPITAL FROM NOTHING AT WHIM, AND FORCES THE MOST POWERFUL OF THEM TO ALIGN THEMSELVES WITH IT.

William decreed that there were no more freeholders. No one could hold a title except from above, and ultimately from the king. William used feudalism to construct the rudiments of a modern state, and he used it well enough to turn a backwards island on the edge of the world into a power to be reckoned with back on the continent.

To help organize his new state and to help it prosper, William promoted trade and commerce, among other ways by importing professional merchants, including Jews. He thus encouraged the fifth civilization, that of the market economy, which led to growth in cities and other interesting developments.

Modern Parallels

Okay, what does this bit of medieval history have to do with the Internet?

TCP/IP is our stirrup. A long chain of innovators from Franklin through Edison enabled us to tame lightning, and an equally illustrious chain from Marconi and Bell onwards showed us how to mount information bareback on it.

But TCP/IP is our stirrup. Before its advent we carried text on the donkey back of books, words on the carrier pigeons of radio, and pictures in the heavy carts of TV. TCP/IP lets us mount all the heavy armor of our information civilization on lightning back.

William's innovations facilitated numerous changes in western civilization, from national consciousness to the Crusades to the eventual emergence of that bastard hybrid of German and French that we call the English language. The Domesday Book in particular let him see the various parts of his domain in a level of detail and comprehensiveness that permitted the promotion of state and market.

In our day, we also have multiple civilizations, not only obvious ones such as the West, Islam, China, and India, but also others that transcend geography. The ancient peasant civilization is

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still the most widespread in many parts of Africa, India, China, and elsewhere. The church is still with us, although in a kaleidoscope of colors that would have dazzled an inquisitor of the middle days. In the West we have not only the splintered Christian church but also Judaism, Islam, Buddhism, Hinduism, Chinese religions, Shinto, Goddess worship, animism in various forms, revivals of ancient religions such as that of William's Viking ancestors, a surge of interest in the old Greek and Roman deities, etc.

While religious institutions (in the West at least) do not have the power or self-sufficiency they once did, educational institutions have become a world unto themselves that has inherited many of the features of the medieval church. Academia has its own ethics: for example, that *everything* must be given away (after one has gotten a grant for it, of course).

Feudalism is mostly dead, but the state is with us and far stronger than William could have dreamed, having in this century fed on our modern crusades, particularly World War II, which doubled the economic control of many states, and the Cold War, which maintained that control. In its communist form, it seemed for a while that the state might soon control everything in large parts of the world.

But the dominant civilization is the market economy, which has spawned numerous strata of itself, from small businesses through corporations more powerful than entire empires of old. In the West the market has largely stamped out agrarian smallholders, co-opted the church, defeated its enemy communism, and formed a symbiotic relationship with the remaining states. You could say the market has been playing the organizational role that feudalism once did, of realigning all the other elements of civilization. Only academia (and maybe the church) really makes a strong claim anymore of marching to a different drummer.

Internet Parallels

Or you could look at it in a different time scale. Forget about millennia or centuries for a moment. Think twenty years, or five. Think about the Internet.

It came out of government, funded as a Cold War project. It was largely developed by academics, many of whom to this day get hot under the collar at any suggestion that they were aiding any sort of war effort. (I have no doubt that the researchers were for the most part simply doing research. However, the early ARPANET money came from ARPA, which was funded by US Navy money.) It was early adopted by elements of the church (ranging from the Presbyterian Church, which has had Presbynet for a long time, to assorted pagan hackers). But now it has moved into the market, and efforts by government and academia to control it are futile.

Government has been forced by popular demand to make massive amounts of information available over the Internet, and by its own judges to refrain from censoring the Internet. Academics routinely exchange research information over the Internet long before it can appear in

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Internet *continued...*

traditional peer-reviewed journals. The Internet has shortened commercial product cycles from maybe three years to eighteen months and even shorter. The Vatican has used thousand-year-old art to turn its Web site into one of the most attractive on the Net, and local churches of all stripes use the Internet to communicate with their own members. Certain Muslim and other countries still attempt to control Internet information flow at chokepoints entering the country, but that won't last as Internet technology becomes cheaper and more mobile and popular demand for the real Net increases.

One could even say that there is yet another modern civilization, that of entertainment. Celebrity is nothing new. A couple thousand years ago Julius Caesar became the most powerful man in the world partly through publishing a book to promote himself. A century ago Matthew Brady directed a crew of photographers to promote everybody from Robert E. Lee to Ulysses S. Grant (and to readers of this column I probably don't have to mention the original Ulysses, a man so famous his name is a household word after more than 3,000 years).

But in a world where a divorced princess with no practical powers can be hounded to death by photographers and then given a funeral with more media coverage than was accorded Winston Churchill or Franklin Roosevelt, not to mention Mother Teresa who died the same week, celebrity is something new and more powerful than seen before.

The Internet draws all these threads together. The tiniest religious sect can make information about itself just as readily available worldwide as can the Pope in Rome. The Queen of England reads her electronic mail, and the President of the United States makes policy about it. Even taxes are in serious doubt in a day when complete privacy of information through strong encryption is more than a possibility; US export laws on that subject are already being avoided by manufacturing the relevant software in countries of the former Soviet Union, for example.

Academia sees itself as fighting the forces of dark commercialism and yearns for the old days (of five years ago). The Net makes captains of industry and princes of capital from nothing at whim, and forces the most powerful of them to align themselves with it. Entertainment is now attempting to take over the Net, with results not quite as anticipated by the suits who thought movies-on-demand were the future. Broadcast channels, programs, serials, mass marketing, advertising, editing, education, even money—all these things have to be rethought in the light of the Internet.

William the Conqueror only had the stirrup and Norman cavalry, and nonetheless changed the world.

Electricity is our horse. TCP/IP is our stirrup. The Internet is our cavalry. The World Wide Web is our Domesday Net.

There are lots of little Williams out there, conquering their little parts of the world. But this thing is bigger than all of them, and nobody knows what it will lead to. However, it is pretty clear that the alignments of freeholder, church, state, academia, market, and entertainment we see today will not be the same ones we see in five years time, and the Internet will be the main reason for their realignment. ■

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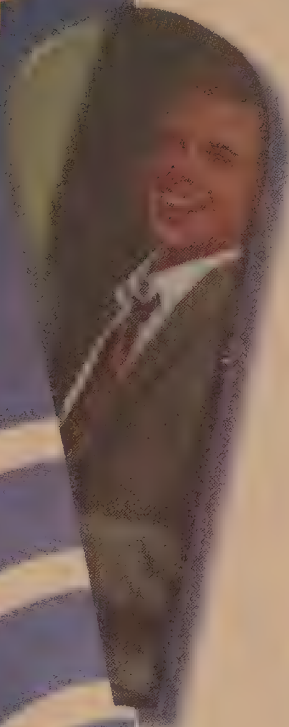

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Bypass Internet Bottlenecks

Digital Island Offers A Better Solution

One day not long ago, it became obvious to Ron Higgins that the existing public Internet infrastructure was jammed with traffic. Furthermore, he suspected that it would be impossible to go from 20 million to 200 million users, and from ASCI text to rich graphics, voice and video, without major changes.

Certainly, the four-lane highway that Internet traffic travels on is approaches overflow, especially during rush hour. Another problem, according to Higgins, is the way the network access points (NAPs) handle traffic.

NAPs are like huge hubs or central relay stations for routing IP traffic. You can view these hops by running some Trace Route program.

Table One

```
 1  3/3  0.031  0.036  0.043  192.
 2  3/3  0.173  0.178  0.183  192.215.96.8     ts11.ccnet.com
 3  3/3  0.205  0.982  2.527  192.215.96.1     hssi.ccnet.com
 4  3/3  0.191  0.715  1.708  206.171.144.1
 5  3/3  0.199  0.227  0.263  206.13.28.82     ign0.snfc21.pbi.net
 6  3/3  0.226  0.239  0.250  165.87.225.6
 7  3/3  0.196  0.275  0.347  198.32.136.19    sanjose1-br1.bbnplanet.net
 8  3/3  0.228  0.909  2.245  4.0.2.29         washdc1-br2.bbnplanet.net
 9  2/2  0.321  0.322  0.324  4.0.1.114        nyc1-br1.bbnplanet.net
10  2/2  0.292  0.299  0.307  4.0.2.122        nyc1-br2.bbnplanet.net
11  2/2  0.264  0.276  0.289  4.0.2.86         cambridge1-br1.bbnplanet.net
12  2/2  0.262  0.278  0.295  206.34.78.1      cambridge1-cr8.bbnplanet.net
13  2/2  0.268  0.268  0.269  206.34.75.250    eco.bbnplanet.net
14  2/2  0.299  0.304  0.309  207.244.95.17    lynn-br2.wharf.shore.net
15  2/2  0.299  0.315  0.331  192.233.85.130   lynn-cr1.wharf.shore.net
16  2/2  0.290  0.320  0.350  192.233.145.44   dock2.wharf.shore.net
```

Table One shows the sixteen hops it takes to send email from my LAN in Concord, CA, to the *Macintouch.com* domain in Massachusetts, for instance. Hops are the dark, squirrely, self-absorbed demons of the Internet that help cause slow throughput, latency, and opportunities for losing packets, all of which slows down performance and reliability of your Internet usage.

Even more hops for overseas traffic. Table Two shows twenty-two hops between my domain and the Spidernet BBS in the Netherlands.

"As these Internet NAPs melt down there is no way to leverage the backplane of hundreds of T-3 circuits," Higgins says. And for overseas traffic it's even worse, as most European and Asian IP traffic travels through NAPs based in the continental US. "The Internet is very US-centric," Higgins explains. While 80% of Internet traffic occurs in the US, almost 100% of data worldwide passes through the US as well. Typically, an email from Rome to Amsterdam hops through the US and gets slowed down in US connections and interchanges.

And there isn't much one can do about it, either here or in Europe, or Asia, except get an address from upstream providers like AT&T, Worldcom, BBN, or UUNet. But once you enter those backbones you inherit all of the problems like latency and lost packets.

Table Two

```
 1  3/3  0.035  0.041  0.050  192.
 2  3/3  0.206  0.219  0.241  192.215.96.8     ts11.ccnet.com
 3  3/3  0.176  0.693  1.661  192.215.96.1     hssi.ccnet.com
 4  2/3  0.210  0.212  0.215  207.21.100.9     wc.paix1.ccnet.com
 5  3/3  0.187  0.210  0.223  207.21.100.6     h-21-100-6.ccnet.com
 6  3/3  0.193  0.220  0.268  205.238.56.90    paix.paix1.verio.net
 7  3/3  0.166  0.175  0.187  205.238.56.93    paix1.mae-west1.verio.net
 8  3/3  0.205  0.678  1.508  198.32.136.12    mae-west.sanfrancisco.mci.net
 9  2/3  0.239  0.245  0.251  204.70.10.249    core3-hssi-1.sanfrancisco.mci.net
10  3/3  0.269  0.306  0.348  204.70.244.1     bordercore1.us1.concert.net
11  3/3  0.261  0.276  0.300  204.70.244.17    hssi6.core1.us1.concert.net
12  3/3  0.311  0.337  0.370  195.99.64.1
13  3/3  0.343  0.372  0.423  195.99.65.98     access1-fa9-1-0.uk1.concert.net
14  3/3  0.353  0.396  0.454  194.72.24.157    uk2-f0-0.eurocore.bt.net
15  3/3  0.347  0.361  0.371  194.72.25.66
16  3/3  0.378  0.405  0.426  194.72.24.3      nl-f0.global.bt.net
17  3/3  0.350  0.381  0.421  194.72.27.134    amsterdam.nl.nl.net
18  3/3  0.342  0.376  0.394  194.178.244.65   rt01.nl.net
19  3/3  0.373  0.400  0.415  194.178.244.113  dt03.nl.net
20  3/3  0.386  0.396  0.406  193.79.239.34    dt02.nl.net
21  3/3  0.356  0.390  0.429  194.178.152.1    gateway.spidernet.nl
22  3/3  0.401  0.410  0.428  194.178.152.12   bbs.spidernet.nl
```

Digital Island

So Higgins decided to bypass these long-haul oversubscribed international circuits when he recently launched Digital Island (*http://www.digisle.net*). Based in Hawaii, Digital Island offers the first global server distribution network to provide non-stop, one-hop transport of IP data anywhere in the world.

Digital Island uses the fiber optic cables that link the Hawaiian communications hub to points around the globe. So far, the Digital Island network has dedicated single-hop connections to Internet points of presence (POPs) in California, Georgia, Texas, Florida, Illinois, Massachusetts, Washington, D.C., Washington State, South Korea, Hong Kong, Japan, Taiwan, Singapore, China, Israel, the UK, Germany, France, and Brazil. By the end of the year, the network will include one-hop connections to the Netherlands, Russia, India, Argentina, and

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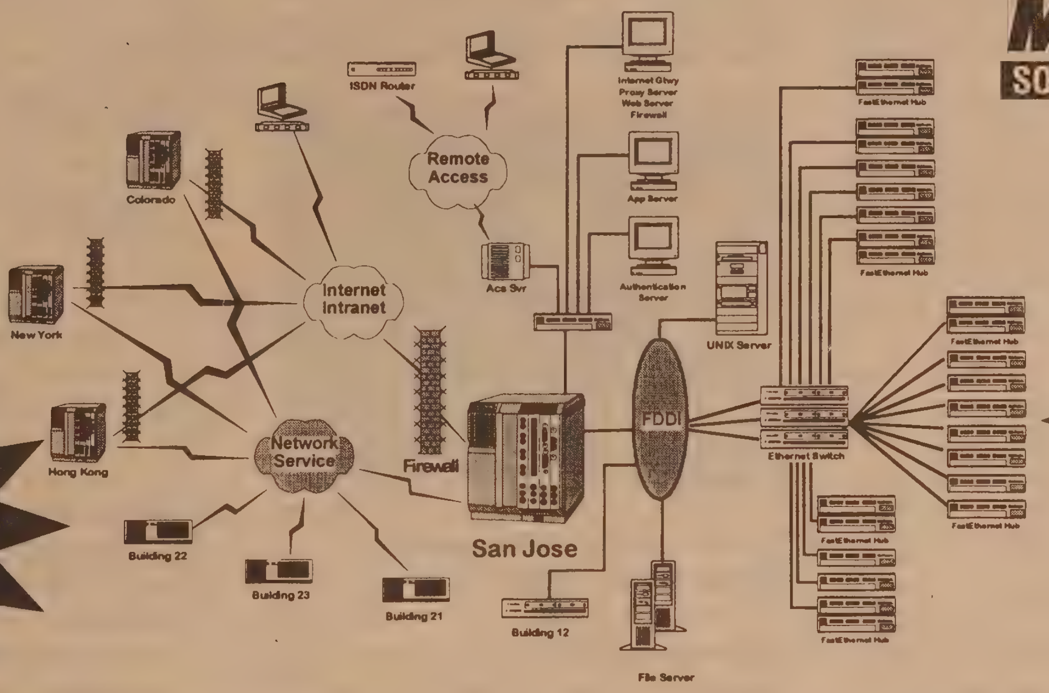
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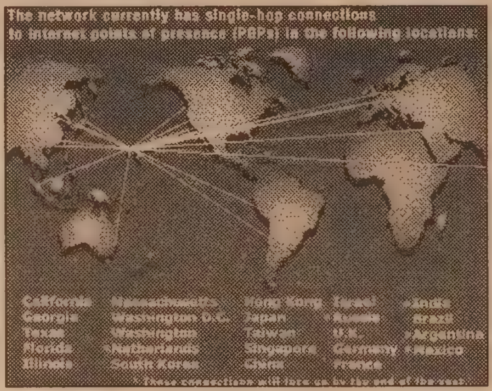
Mexico. By contracting with telecommunications companies and ISPs in each location, Digital Island offers users an "Extranet" that provides minimum transmission rates of 1.5Mbps.

With its own IP network and dedicated circuits, Digital Island can provide Net access comparable to US NAPs but without the congestion, slowdowns, and multiple hops. Essentially, Digital Island becomes the publisher of some corporation's Web content. They contract with ISPs in various countries to be the live mirror site, so that users outside the US can receive the data as if it were virtually next door, and not twenty-two hops away.

Bypassing the NAPs that are the main bottlenecks for worldwide telecommunications, Digital Island provides any company needing to send massive quantities of data overseas a real fighting chance of winning out over the worldwide wait. Digital Island hopes to reach thirty countries by the end of the year, and is one of the first to be invited by the Chinese government to provide network connectivity into Beijing. Companies like Cisco, Stanford, and National Semiconductor have all found great benefit in using Digital Island's dedicated IP net.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Taiwan
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China
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*Russia
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Germany
France
*India
Brazil
*Argentina
*Mexico
* These connections will be up by the end of the year.

Case Study: National Semiconductor

Case in point is National Semiconductor (NSC), a growing company that needs to know its Web connections are robust (*http://www.national.com/design*). A fairly active Web site, NSC's site gets almost 25,000 hits per day, peaking to six million per month, from prospective customers, plus handling of NSC's intranet of resellers. According to Phil Gibson, NSC's director of interactive marketing, "On a daily basis, we're serving maybe 10,500 data sheets in PDF format that are anywhere from 10–200KB."

NSC's customer profile is changing rapidly, too. Over the past two years Gibson has seen business on the Web site go from 90% from within the US to over 55% from outside the US. From a production standpoint Gibson sees user activity of 2.7 screen downloads per visit, where some user downloads a data sheet and makes some transaction. "If it takes more than two seconds per screen, we're likely to lose orders," Gibson notes.

Hearing from overseas clients that performance was slow, NSC attempted to break the IP bottleneck by establishing mirror sites in five locations around the world. A big task, costing $150,000 to $220,000 per site per year.

"So when we heard of Digital Island's "Overnet" concept, it hit extremely well. Critical to us was the ability to replicate our site only once instead of six

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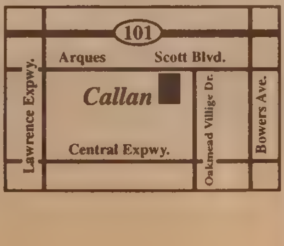

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Online Services *continued...*

times." Since it was more an issue of literature fulfillment, Digital Island's solution made it much easier to maintain that one database, instead of trying to republish it to five other mirrors. "That, plus the cost savings from maintaining those sites—all of those headaches go away."

More importantly, Gibson finds Digital Island's performance a critical component of his ongoing sales automation effort for NSC. "By providing my customer with crisp performance and a robust network I am better able to extend NSC to a worldwide user base," Gibson explains. "With Digital Island, I am better able to serve my customer, find out their likes and dislikes, or what samples over the past three months have been ordered the most, for example.

"Because my network is easier to use and more responsive I get better information. That gives me the ability, from looking at my leading indicators for instance, to modify my message faster than the other guy. If my network takes forever to download a screen in Singapore... in reality, they'd bail. One long screen download like that and I'm outta there, too. So it's a dramatic competitive advantage."

In addition to improving customer service, the Digital Island infrastructure is helping NSC extend its private network to sales force automation, as well. "It's a very motivated channel," Gibson quips, speaking of his 8,000+ extended worldwide sales force working on commission. "Digital Island enables me to leverage my distribution network worldwide and lets NSC move at the speed of a startup."

Publishing Solution

According to John Sacks, director of Stanford's Highwire *(http://highwire.stanford.edu)* online publishing group, anyone needing to deliver large files to an overseas audience with reliability and speed should look into Digital Island as an alternative to regular Internet delivery. Highwire uses the Internet to publish twenty of the world's leading science and medical journals, with sixty more coming online soon.

A large percentage of subscribers access the journals from overseas. "We were hearing from our European and Asian subscribers that files that would only take thirty seconds or one minute to download from within the US took five to fifteen minutes to download from outside the US," Sack notes.

Using the public Internet, Sack couldn't afford to establish mirror sites across the globe. It would be near-impossible to keep each site up to date. "With 500 pages of new content each day and database content being constantly updated, plus the security and access issues made our site and mission just too complex for mirror sites."

"We wanted speed and reliability," Sack explains. "Digital Island said, 'Hey, run your own tests on our network and tell us what you think.' So we set up small test mirrors in the UK and another in Germany, and found that Digital Island's throughput was consistently about 60% better than using the regular public Internet feed for overseas transaction." ■

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Accord Systems *http://www.accordsys.com* Accord Systems distributes Novell Labs, tested and approved Ethernet, ARCNet, Token Ring network products, as well as fine notebook computers. [Exp. #171.]

California Support Calculator *http://www.pegasussoft.com* Pegasus Software offers the California Support Calculator for calculating child and spousal support in the California Family Law courts. [Exp. #173.]

CM Solutions *http://www.cm-solutions.com* Management consulting and custom software design. [Exp. #173.]

Destination Data Network, Inc. *http://ddninc.com* Group travel, meeting, planning, and destination management software. [Exp. #171.]

Digital Dragon Demos *http://www.cddesign.com* I Ching software for Win95. [Exp. #171.]

DSL Modems *http://www.aspeninet.com* Megabits speed for Internet access or between buildings. Less than $900 per circuit. ISP specials. [Exp. #172.]

Extensis Corp. *http://www.extensis.com* Extensis provides software enhancement plug-ins for Photoshop, QuarkXPress, Illustrator, Freehand, and PageMaker. [Exp. #172.]

Family Tree Maker Web Site *http://www.familytreemaker.com* Web site for information about Family Tree Maker, plus articles on creating your own family books, and more. [Exp. #172.]

Kemosabe's Font Archive *http://magnagraphics.com/fonts* See Kemosabe's Font of the Week, new fonts and dingbats every week! Check it out! [Exp. #171.]

Mac95 *http://mac95.home.ml.org* Make Windoze95 look like MacOS! Much more than just a theme. [Exp. #171.]

Mushkin Memory Storefront *http://www.mushkinink.com/cgibin/intershop.storefront* Mushkin's secure online memory and computer parts store. [Exp. #171.]

Omicron Consulting *http://www.omicron.com* A strategic IT consulting firm that leads our clients through the transition to Internet and client/server technologies. [Exp. #171.]

ProgramasNet.com *http://www.programasnet.com* The best freeware/shareware site for Windows and Macs in Spanish. Daily updates. [Exp. #171.]

Sanyo-Verbatim CD Co. *http://www.sanyo-verbatim.com* Compact disc, CD-ROM, and DVD manufacturing, distribution, and warehousing. [Exp. #172.]

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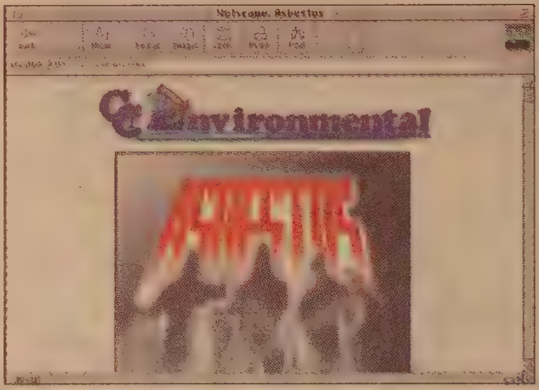
Thom-Tech *http://www.thom-tech.com* Electronic solutions: printed circuits, schematic capture, technical manuals, hardware prototypes, Web site design. [Exp. #172.]

WordPerfect Headquarters *http://www.wp.com/MacroExpert* WordPerfect tips, articles library. Law office support: training, productivity planning, and more. [Exp. #172.]

Xiox *http://www.xiox.com* A leading provider of telecommunications solutions. [Exp. #172.]



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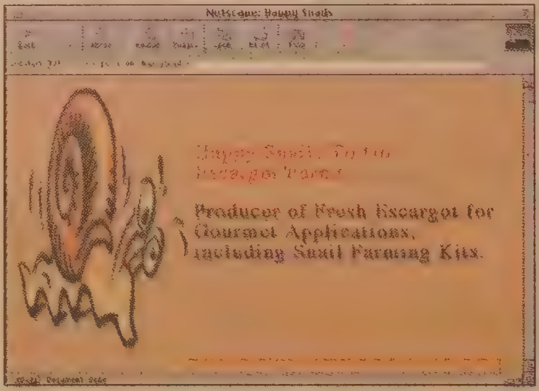

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A2ZBIZ—Total Internet Presence *http://www.a2zbiz.com/* Professional services in site design, multimedia, and hosting. Extensive marketing experience, reasonable prices. [Exp. #173.]

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BinaNet Web Page Design And Presence *http://elbin.com/BinaNet/* Offers Web site design, development, presence, and hosting. [Exp. #172.]

BotSpot *http://www.botspot.com* The spot for all bots and agents on the Net, including fourteen searchable bot classification databases, FAQs, libraries, articles, newsletters, e-journals, and more. [Exp. #172.]

Creative Computer Solutions *http://www.hooked.net/~davemark/mactech.html* Web design for small businesses, schools, and individuals. Macintosh tech support and training also available. [Exp. #171.]

Cuenet Interactive Internet *http://www.cuenet.com* Listservs, email, WWW, domain hosting, site development, and complete outsourcing. [Exp. #172.]

DesktopWEB Crawler *http://www.desktopweb.co.at/search/* German language Web crawler and email service. [Exp. #172.]

Dolphin Design Web Publishing *http://www.ddesign.ch* Web designing. [Exp. #172.]

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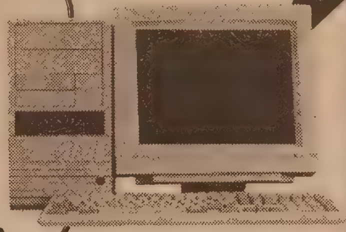

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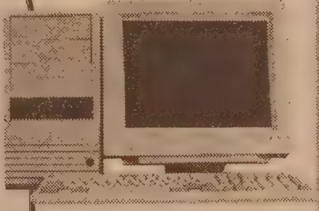

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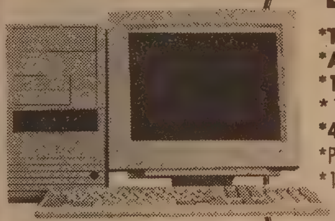

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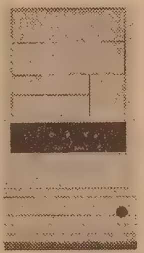

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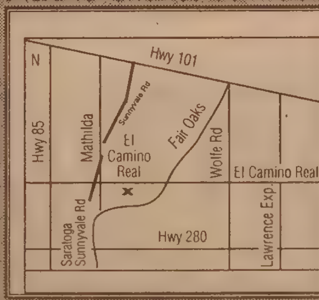

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- **Yamaha OLP4 SA Audio on Board**
- 56K Internal Fax/Modem (Diamond)
- **ATI 64 Bit 3D w/2MB EDO on Board**
- ATX Tower Case w/235W Power Supply
- Multimedia Speakers 80W #881
- ECI 104 Keyboard w/PS/2 Style
- Microsoft OEM PS/2 Mouse w/Pad
- Windows 95, CD-ROM Ver.

Monitor Not Included

166MHz MMX $989
200MHz MMX 1095
233MHz MMX 1199

ECI P-5 OFFICE Partner Multimedia w/33.6 Fax/Modem

- Intel 430TX Chipset Motherboard
- Intel Pentium® Processor (75-233MMX)
- 512K Pipeline Burst L2 Cache
- 32MB RAM, Exp. to 256MB
- 1.44 MB Floppy Drive
- 3.1GB EIDE Hard Drive
- 16X EIDE CD-ROM Drive
- Sound Blaster AWE 64 Value (OEM)
- 33.6kbps Internal Fax/Modem (USR)
- Diamond Stealth 64 PCI w/2MB DRAM
- Mid-Tower Case w/230W P.S.
- Multimedia Speakers 80W #881
- Enhanced 104 Key Keyboard
- Microsoft OEM Serial Mouse w/Pad
- Windows 95 (OEM, CD-ROM Ver.)

Monitor Not Included

166MMX..................$979
200MMX..................1089
233MMX..................1199

hp

All Models Include Keyboard & Mouse

PRODUCT#	CASE TYPE	CPU	RAM	MODEM FAX	HARD DISK	CD-ROM DRIVE	AUDIO	VGA	O/S	PRICE
D4596 B	D.T	200MMX	32MB	NO	2.5GB	24X	YES	2MB	WIN 95	**$1679**
D5631 A	D.T	200MMX	16MB	NO	2.5GB	OPT	NO	2MB	WIN 95	**$1469**
D3991N	D.T	166MMX	32MB	NO	2.5GB	8X	YES	2MB	WIN 95	**$1783**
D3993 A	D.T	200MMX	16MB	NO	2.5GB	8X	YES	2MB	WIN 95	**$1729**
D4731 A	M.T	166MMX	16MB	NO	2.5GB	16X	NO	1MB	WIN 95	**$1479**
D4735 A	M.T	166MMX	24MB	33.6K	2.5GB	16X	YES	1MB	WIN 95	**$1529**
D4737 A	M.T	200MMX	32MB	33.6K	3.8GB	16X	YES	2MB	WIN 95	**$1899**
D5085 A	M.T	200MMX	24MB	NO	2.5GB	16X	NO	1MB	WIN 95	**$1639**
D5220 B	M.T	166MMX	16MB	NO	2.5GB	24X	YES	2MB	WIN 95	**$1495**
D5221 B	M.T	200MMX	32MB	NO	2.5GB	24X	YES	2MB	WIN 95	**$1739**
D5493 B	D.T	166MMX	16MB	NO	1.6GB	NO	NO	2MB	WIN 95	**$999**
D5495 B	D.T	200MMX	16MB	NO	1.6GB	NO	NO	2MB	WIN 95	**$1119**

*PLEASE CALL FOR OTHER MODELS *MONITOR SOLD SEPARATELY *3-YEAR WARRANTY

FAX MODEMS

USRobotics

The Intelligent Choice In Data Communications

33.6/Sportster V.34 Int/Ext #840/839	$115/135
56K Courier Int/Ext	$239/299
56K/Sportster Int/Ext	$175/189
56K/Sportster w/Voice Int/Ext	$199/219
MOTOROLA	
Bit Surfer Pro ISDN Ext	$299
56K Modem Surfer Int/Ext	$109/125
56K Voice Surfer Int/Ext	$115/129
DIAMOND	
56K Fax Modem w/Voice Int	$115

ETHERNET CARDS

3Com®	
3COM 3C509 B-TPO/Combo ISA	$49/79
3COM 3C900 PCI TP/Combo	$69/85
3COM 3C905TX PCI 10/100 TP/5 Pack	$69/329
intel®	
PILA 8465B Pro 100 PCI/5 Pack	$55/265
SMC	
Ether EX PnP 16-Bit ISA 8416BT Combo	$69
9432TX 100BaseTX	$69
5312TX 12-Port 100TX Hub	$739

MOTHERBOARDS Call for Products Not Listed (CPU Not Included)

intel®	
Portland Pentium® II "ATX" 440FX	$195
Portland Pentium® II w/Audio 440FX	$209
Providence Dual Pentium® Pro 440FX	$479
Atlanta Pentium® II "ATX" AL440LX	$199
Atlanta Pentium® II "ATX" AL440LX w/Audio	$229
Anchorage w/512K/Audio/ATI 2MB 430TX	$215
Anchorage w/512K & Audio 430TX "ATX"	$189
ASUS	
VX97 P75-200 430VX (Supports MMX)	$99
TX97XE P75-200 430TX (ATX)	$165
KN97-X Pentium® II ATX 440FX	$275
P65UPS Dual Pentium® Pro 440FX	$459
P2L97 Pentium® II ATX 440LX	$239
SuperMicro USA	
P6DKF Dual Pentium® II 440FX	$335
P6SKS Pro Pentium® II w/2940UW ATX 440FX	$329
Shuttle (Spacewalker)	
HOT-631 Pentium® II ATX 440LX	$215
HOT-559 P75-200 w/2940UW ATX 430VFX	$219
HOT-555A 512K P75-233MMX 430VX	$99
HOT-569 512K P75-233MMX/AMD K6 430TX	$119

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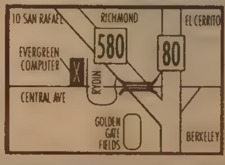

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NOTEBOOKS

HEWLETT PACKARD FUJITSU IBM HITACHI MOBILIZED COMPUTING

TOSHIBA NOTEBOOK

MODEL#	CPU	ND	RAM	CD	MDM	SCREENS	PRICE
220 CDS	133	1.3	16	10X	NO	12.1DSTN	$CALL
440 CDT	133MMX	1.4	16	10X	33.6	12.1TFT	$CALL
440 CDX	133MMX	1.4	16	10X	NO	12.1TFT	$CALL
460 CDT	166MMX	2.1	32	10X	33.6	12.1TFT	$CALL
510 CDT	133	2.1	16	10X	28.8	12.1TFT	$CALL
730 XCDT	150MMX	2.1	16	10X	28.8	12.1TFT	$CALL
740 CDT	166MMX	3.0	16	10X	28.8	13.3TFT	$CALL

HEWLETT PACKARD OMNI BOOK

MODEL#	CPU	HD	RAM	CD	MDM	SCREENS	PRICE
800 CT F1360A	166MMX	2.0	16	8X	NO	10.4TFT	$3629
2000 CT F1373A	133MMX	1.8	16	NO	NO	12.1TFT	$2969
2000 CS F1371A	133MMX	1.3	16	NO	NO	12.1DSTN	$2049
5700 CT F1352A	150MMX	1.8	16	NO	NO	12.1TFT	$2925
5700 CTX F1355 A	166MMX	1.8	16	NO	NO	12.1TFT	$3379

IBM THINK PAD

MODEL#	CPU	HD	RAM	CD	MDM	SCREENS	PRICE
380 D 26353AU	150MMX	2.1	16	8X	NO	12.1TFT	$2995
380 E 263540 U	150MMX	2.1	16	OPT	NO	12.1DSTN	$2137
380 ED 26356 AU	66MMX	3.0	16	8X	NO	12.1TFT	$3629
560 E 264030 U	150MMX	2.1	16	NO	NO	11.3DSTN	$2719
264040 U	166MMX	2.1	16	NO	NO	12.1TFT	$4179
760 XL 9547U9C	166MMX	2.1	16	OPT	NO	12.1TFT	$3795
765 D 9546U9H	166MMX	3.0	32	8X	NO	13.3TFT	$5489
760 XD 9546U9E	166MMX	3.0	32	8X	NO	12.1TFT	$4499

FUJITSU LIFE BOOK

MODEL#	CPU	HD	RAM	CD	MDM	SCREENS	PRICE
535 TX	133MMX	2.0	16	20X	33.6	12.1TFT	$2395
555 TX	150MMX	2.0	16	10X	33.6	12.1TFT	$2595
565 TX	166MMX	2.0	32	20X	33.6	12.1TFT	$4069
655 TX	150MMX	1.3	16	8X	33.6	12.1TFT	$3279

HITACHI VISION BOOK

MODEL#	CPU	HD	RAM	CD	MDM	SCREENS	PRICE
4150 X	150MMX	1.4	16	10X	33.6	12.1DSTN	$2169
4360 X	166MMX	2.1	16	10X	33.6	12.1TFT	$2759
7340	133MMX	1.4	16	10X	56K	12.1TFT	$2549
7360	166MMX	2.1	32	10X	56K	12.1TFT	$3895
8560	166MMX	2.1	16	10X	56K	13.3TFT	$4139
MX166T	166MMX	2.1	16	8X	33.6	12.1TFT	$3229

*PLEASE CALL FOR ANY MODEL NOTEBOOK INFORMATION

SVGA LCD Projectors

Model	LCD Type	ANSI Lumens	Proj. Size	True Res	Price
NEC MT 800	3-Panel	370	20"-400"	800x600	$5795
Infocus LitePro 220 D	1-Panel	250	33"-250"	800x600	$3895
3M MP 8030	3-Panel	500	20"-300"	800x600	$5259
Proxima DP9100	1-Panel	300	52"-161"	1024x768	$10125
ViewSonic PJ800	3-Panel	550**	20"-300"	800x600	$4595

PC HARD DRIVES

Quantum

3.2GB UIDE 33240ST-A	$239
4.3GB UIDE 34320ST-A	259
6.4GB UIDE 36480ST-A	349
2.1GB SCSI QM 32160S	269
3.2GB SCSI QM 32275W	339
4.5GB SCSI QM 34550SW	659

FUJITSU

1.2GB EIDE M1636TAU	$129
1.7GB EIDE M1623TAU	139
2.1GB EIDE M1624TAU	185
2.6GB UIDE 3026AT	179

Maxtor

3.2GB EIDE 83240D4	$209
5.0GB EIDE 85250D6	289

WESTERN DIGITAL

1.2GB EIDE 21200	$155
1.6GB EIDE 21600	159
2.0GB EIDE 22000	185
2.5GB UIDE 32500	195
3.2GB UIDE 33200	209
4.3GB UIDE AC34300	269

Seagate

1.2GB EIDE ST31276A	$149
1.7GB EIDE ST31720A	155
2.1GB UIDE ST32122A	179
2.5GB EIDE ST32531	189
9.0GB SCSI ST19171N	979
9.0GB WSCSI ST19171SW	995

CD-ROM DRIVES

TOSHIBA

24X IDE XM-6102B	$95
DVD ROM/MPEG-2 Kit	319
12X SCSI XN-5701B	115

PANASONIC

24X IDE CR585	$89
8X SCSI CR506S	85

SONY

16X IDE CDU511	$85

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Four (4) 5.25" SCSI-I/II/III	105/139/159
Eight (8) 5.25" SCSI-I/II/III	215/259/289

APC AMERICAN POWER CONVERSION

BACKUP POWER SUPPLIES AT

APC 280VA Back-UPS	$109
APC 450VA Back-UPS	199
APC 600VA Back-UPS	259
APC 1000 Backup-UPS Pro	385
APC 1000 Smart-UPS	469
APC 1400 Smart-UPS	599

MONITORS

PROTON

15"	GM-1562C	1280x1024	.28	$235
17"	GM-1765B	1280x1024	.25	469

SAMSUNG

17"	17GLi	1280x1024	.28, AT 60Hz	589
17"	17GLSi	1600x1200	.26, AT 68Hz	739
20"	20GLSi	1600x1200	.28, AT 66Hz	1235

HITACHI

15"	CM500U	1280x1024	.28	299
17"	CM620U	1280x1024	.28	529
17"	CM630U	1600x1200	.22	665
21"	CM800U	1600x1200	.22	1375
21"	CM802U	1600x1200	.22	1639
21"	CM803U	1800x1440	.22	1675

VIEWSONIC

14"	E641	1024x768	.28	$219
15"	15GS	1280x1024	.28	309
15"	E655	1280x1024	.28	285
17"	G771	1280x1024	.27	519
17"	17GA	1280x1024	.27, w/Spk,	575
17"	17PS	1600x1280	.27	645
20"	G800	1600x1280	.28	975
20"	GT800	1600x1280	.30	1129
21"	P810	1600x1280	.25	1269
21"	P815(New)	1800x1440	.25	1419

SONY

15"	100SX	1280x1024	.25	$339
15"	100SF	1280x1024	.25	359
17"	200SX	1280x1024	.25	595
17"	200SF	1280x1024	.25	649
20"	300SFT	1600X1200	.25	1379

NEC

15"	E500	1280x1024	.25	$389
15"	M500	1280x1024	.25	379
17"	P750	1280x1024	.25	829
17"	XV17+	1280x1024	.28	645
21"	P1150	1600x1200	.28	1489

TAPE BACKUPS

Seagate TAPE DRIVES

3.2GB Internal w/Tape	$199
8.0GB Internal SCSI STD 28000n DAT	779

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4.0GB SCSI 4mm DAT C1536A Int	$619
8.0GB SCSI 4mm DAT C1528H Int	929
24GB SCSI 4mm DAT C1555A Int	1349
3.2GB T-3000 Internal w/Tape	185
8.0GB T-4000S SCSI II w/Tape	369

SYQUEST TAPE DRIVE

230MB EZ Flyer IDE Int	$149
230MB EZ Flyer Parallel ELT	149
230MB EZ Cartridge 1 pcs/10 Pak	19⁹⁵/179
1.5GB SYJET SCSI Int	289
1.5GB SYJET SCSZ Ext	369
1.5GB SYJET Parallel Ext	369
1.5GB SYJET IDE Ext	289
1.5GB SYJET Cartridge 1 pcs/3 Pak	99/269

IOMEGA ZIP/JAZ DRIVE

100MB Zip Drive IDE Internal (OEM)	$129
100MB Zip Cartridge 3 Pak/10 Pak	45/109
1GB JAZ Drive Int./Ext. SCSI	295/379
1GB JAZ Cartridge 1PCS/5 Pak	95/429
5 Pak/10 Pak	439/860

PRINTERS

HEWLETT PACKARD

LASERJET PRINTERS

6LXi, 1MB, 6ppm, 600dpi	$389
6PXi, 2MB, 8ppm, 600dpi	739
6MP, 3MB, 8ppm, 600dpi	885
4V, 4MB, 16ppm, 600dpi	1769
4MV, 12MB, 16ppm, 600dpi	2595
4000 4MB, 17ppm, 1200dpi w/2 Trays	1195
4000T 4MB, 17ppm, 1200dpi w/3 Trays	1339
4000N 8MB, 17ppm, 1200dpi w/2 Trays	1519
4000TN 8MB, 17ppm, 1200dpi w/3 Trays	1639
5Si, 4MB, 24ppm	2419
5SiMX, 12MB, 24ppm	3419
Color LaserJet 5, 20MB 7B, 3 Color	3779
Color LaserJet 5M, 36MB, 7B, 3 Color	4769

DESKJET PRINTERS

670C 600x600	$225
692C 600x600	289
890CXI 600x600, 9ppm	439
1000CXi 600x600 up to 11x17 Paper	489
1600C 600x600	1289
1600CM 600x600 w/PS	1889

EPSON

LQ-2070 Plus 24 Pin 135 Columns	$399
LQ-570 Plus 24 Pin 80 Column	269
STYLUS Color 400 720x720 4 Black 3 Color	215
STYLUS Color 600 1440x720 6 Black 4 Color	289
STYLUS Color 800 1440x720 8 Black 7 Color	379

SCANNERS

HP SCANJET 4C HEWLETT PACKARD

- 2400-dpi enhanced resolution - 600dpi optical w/adobe Photoshop LE
- Calera Word Scan OCR Software **$689**
- **Scanner Jet 5S for PC Color 269**

5P, 24-Bit, Color 300dpi $299

UMAX

Vista-S12 1200x600 dpi 30-bit $585

EPSON

EXP636EPC 4800x4800 dpi 36-bit $799

HP TONER CARTRIDGES

HP 92275A HP IIP, IIP+, IIIP	$79
HP 92295A HP IID, II, III, IVD	69
HP 92291A HP IIISi, IVSi	119
HP 92298A HP4 4+, 4M, 4M+, 5, 5N, 5M	99
HP 92274A HP4L, 4P,4MP	65
HP C3903A HP 5P, 5MP, 6PXi	81
HP C3906A HP 5L, 6LXi	65

VGA CARDS

ATI

3D Xpression 2MB EDO PCI	$65
3D Xpression 2MB PCI SG RAM	75
3D Xpression 4MB PCI SG RAM	95

DIAMOND

Alliance 2MB DRAM PCI	$45
Stealth 64 2MB VRAM (3240)	95
Stealth 64 4MB VRAM (3400)	135

OTHERS

S3 (765) PCI w/2MB MPEG	$39

MATROX

Millennium II 1600x1280 (OEM) 4MB/8MB WRAM (up to 16MB)	$CALL/CALL
Upgrade module for Millennium 4/8/12MB	**$135/215/295**
Matrox Mystique 220 2/4MB SGRAM	**$109/129**

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Web Page Listings

continued from page 162

Sosnoski Software Development *http://www.sosnoski.com* Internet and Web development services including Java and JavaScript, client-side programming, ASP, ActiveX, and LiveWire server-side programming. [Exp. #172.]

Stewart WebTV Sales & Internet Consulting Business Opportunities *http://www.stewartpiper.com* Sales of Philips Magnavox WebTV Internet terminals and future Internet consulting business oppportunities. [Exp. #172.]

Studio Gallo *http://www.studiogallo.com* Web site design. [Exp. #171.]

Techlinknet *http://www.techlinknet.com/* Techlinknet Web Developer is an online Web page creator that anybody with Internet access can easily use. [Exp. #172.]

The-Net Site *http://www.the-netsite.com* Web hosting shopping mall. [Exp. #172.]

Virtual Web Servers *http://www.virtualisys.com/vr/jwilcox* Need Web space for your corporate presence? Looking for a place to make your home on the Web? You've found it. [Exp. #172.]

Web Craft Designs *http://www.webcraftdesigns.com* Quality Web page design for small businesses. We do custom graphics, consultation, page design, etc. [Exp. #171.]

Web MS Promote *http://www.webms.net/promote.html* Listing of the best sites to promote your Web page. [Exp. #173.]

Web Site Manager *http://www.adgrafix.com/info/aprice* Easily create, update, and manage your Web site. Online demo. [Exp. #171.]

webCorporate *http://www.webcorporate.com* Web site packages and components that grow your business! You know how much it costs up front. We host. [Exp. #173.]

Webfix *http://members.tripod.com/~lvazquez/webfix* Quick, cheap, and easy Web design and maintenance. Internet consultation. [Exp. #172.]

Zimway Consulting Group *http://www.zimway.com* Web hosting with domain name, high traffic capability, monthly statistics autogenerated, reasonable prices. [Exp. #171.]

SERVICES & PRODUCTS FOR SALE

American-Grown Products *http://www.bigbook.com/tradebalance* Hawaiian Macadamia nut products, Kona coffee, and dried fruit. [Exp. #172.]

Asbestos Consultant *http://www.ccienv.com* Asbestos project management. [Exp. #173.]

Baskets By Dorthy *http://basketcraze.com* Bay Area company specializing in custom-designed gift baskets for personal or corporate needs. [Exp. #171.]

Blen Koch Photography *http://home.earthlink.net/~blenk/* Fine photography for any occasion. [Exp. #172.]

Bobiona Personal Computer Designs *http://www.bobiona.com* Personalized gifts for all: Put your picture on t-shirts, clocks, aprons, mouse pads, and more. [Exp. #172.]

Bodyguard Extreme Defying All Odds *http://pw1.netcom.com/~s.champe/bodygd1.htm* Elite professional bodyguard services and training. Seminars, bodyguard resumes, movies, and stuntmen. [Exp. #172.]

The Booksmith *http://www.booksmith.com* Online bookstore: searchable inventory, events calendar, reviews, features, and more. [Exp. #171.]

BPW Limited Photographic *http://www.bpwltd.com* Dealer in collectable and usable cameras, lenses and accessories. We buy, sell, trade and repair worldwide. [Exp. #171.]

Business at Home *http://www.mub.com* Home-based business. [Exp. #171.]

Business Products Express, Inc. *http://www.bpexress.com* Offering 25,000+ office products below superstore prices, delivered next day. Distributorships available. [Exp. #173.]

Centerclair Nursing Home *http://www.centerclair.com* A nursing facility with skilled nursing accommodations. [Exp. #171.]

Cheese Head Express *http://www.imall.com/stores/cheesehead* Wisconsin's finest cheese, sausage, cheesehead beer, bratwursts and more delivered to your front door! [Exp. #172.]

Cool Shopping Sites *http://www.coolshopping.com* Showcases over 250 of the most innovative, unique, and top-quality shopping sites on the Web. [Exp. #171.]

Custom Truck Products *http://www.customtruckproducts.com* Distributors of quality light truck, van, and SUV accessories. [Exp. #171.]

CyberNiche Home Business Opportunity *http://www.totalmarketing.com/cyberniche* 8,000 educational and how-to videos and CD-ROMs. Learn new skills, educate children, and improve quality of lives. [Exp. #172.]

Diamond International Consolidators Ltd. *http://www.diamond-international.com* [Exp. #171.]

Earth Smart Laundry CD *http://www.sirodinc.com/laundrycd1.html* Earth Smart Laundry CD replaces detergent and fabric softener. [Exp. #171.]

Elliott Aviation, Inc. Home Page *http://www.elliottaviation.com* Full Service FBO for General Aviation Aircraft located in the MidWest (IL, IA, MN, NE). [Exp. #171.]

Energy BioSystems Corp. *http://www.energybiosystems.com* A company commercializing biotechnology using bacteria to remove sulfur from oil. [Exp. #173.]

Expressbooks.com *http://www.expressbooks.com* Internet discount bookseller discounting selected bestsellers 40%, hardcovers 32% and paperbacks 22%. Fastest service available. [Exp. #172.]

The Florentine Connection *http://www.florentineconnection.com* Importers of Italian shoes, ceramics, kitchenware, paper products, novelty items, and wooden Pinocchio's. [Exp. #172.]

For My Baby *http://www.formybaby.com* Unbeatable prices for baby strollers, educational and developmental toys, and other accessories for newborn to preschool age children. The site features a searchable database and information about each product. [Exp. #173.]

Gammonson Printing & 3A Calendars *http://www.gammonson.com* Custom inprint calendars and offset printing brokerage. [Exp. #172.]

Global Connections New Zealand! *http://www.globalconnections.co.nz* Promotion of environment-friendly gifts and products from developing countries and renewable resources. [Exp. #171.]

Global Discount Virtual Mall *http://www.wimall.com/netvalue* Ever-expanding range of quality discount products. Online discount shopping mall. [Exp. #171.]

Happy Snails *http://www.pcwi.com/happysnails* Producer of the finest, fresh escargot for gourmet applications. [Exp. #172.]

Home Movie Transfer *http://www.oztech.com/movietime* Home movies, photos, slides copied to video tape. Photos from video tape. [Exp. #171.]

Horticultural Home Page *http://home.earthlink.net/~raretrees* This (commercial) site contains horticultural, landscape, and rare, exotic plant info in great abundance. [Exp. #171.]

Houston Stained Glass Supply *http://hsgs.com* Wholesale glass supplies. [Exp. #173.]

InMart *http://www.inmart.com/inmart/* Internet grocery shopping in San Francisco—superior quality, competitive prices, and free home or office delivery anywhere in San Francisco. [Exp. #171.]

Jim's Flowers *http://www.jimsflowers.com* Providing complete floral services. Same day delivery guarantee. Monthly contests for free roses. [Exp. #172.]

Kimball And Company Restaurant Services *http://kimballandcompany.com* Restaurant site locations and business brokerage. [Exp. #172.]

L.A. Food Services *http://www.lafoods.com* Food and vending services. [Exp. #173.]

Latinas International Introductions *http://www.quantum-net.com/latinas/* Personal ads from beautiful Latin and South American women seeking husbands. [Exp. #172.]

Left Coast Media *http://www.leftcoastmedia..com* Producers of entertainment content. [Exp. #172.]

Logo Identification Products *http://raynorassoc.com* [Exp. #172.]

Logo Watches *http://www.adwatch.com.mx* Customized logo watches. [Exp. #172.]

Lucy's Knits *http://web.dreamcom.net/~lueknits* Shop for hand knitters. [Exp. #173.]

Lux Transfer & Storage *http://www.luxtransfer.com* Atlas Van Lines agent: Industry leader in relocations via the internet. [Exp. #173.]

Madison Cycles Home Page *http://ourworld.compuserve.com/homepages/madisoncycles* The #1 distributor of cycling products in the United Kingdom. [Exp. #171.]

Marcus J. Leathers *http://www.jps.net/maj* Selling leather garments, boots, and accessories at low prices. [Exp. #171.]

Mercedes-Benz North America *http://www.mbusa.com* Mercedes-Benz Official US Web site. [Exp. #171.]

Naveena Group Of Industries *http://www.naveena-textile.com* The group Naveena has been a progressive name in the textile industry for nearly three decades in Pakistan. [Exp. #172.]

Ocean Optics, Inc. *http://www.oceanoptics.com* Manufacturers of miniature fiber optic spectrometers. [Exp. #172.]

Oceatac-Underwater And Offshore Construction Experts *http://www.interem.net.mx/oceatec* Oceatec has 10 years of experience performing underwater and surface inspections, construction and maintenance. [Exp. #171.]

Palmer Detective Agency *http://www.members.aol.com/dashiell41/index.html* All cases performed by former law enforcement personnel: criminal, civil, and private matters handled. (CA Lic. #PI 16132) [Exp. #173.]

Pandora & Pendragon Body Adornments *http://panpen.com* Custom jewelry in sterling and gold with precious stones and gems for fetish, gothic, fantasy, piercing including slave collars, cuffs, chains, and pendants of every sort. [Exp. #171.]

PCS Cellphone Info *http://www.angelfire.com/ca/cellphones/index.html* The latest information on PacBell and Sprint PCS cellphones: pictures of phones, pricing, and service. [Exp. #172.]

Planet Health: The Best Of Health *http://www.planet-health.com* Planet Health is a powerful health information and decision-making system. [Exp. #171.]

Preferred Customer Plan *http://asktom-naturally.com/homebiz/bgmproducts.html* Affordable nutrition suppliments. [Exp. #171.]

Rainbow Golf Collection *http://www.greenharvest.com/gaygolf* If you or a friend have an interest in Rainbow Golf Apparel and Accessories for the out and proud gay/lesbian golfer, then our Web site is the perfect place to visit. [Exp. #172.]

Research Pub—Cool Visits For Pay *http://members.aol.com/reserchpub/respub.htm* [Exp. #172.]

RJL Texas International Corp. *http://www.netcom.com/RJL* Retail mail-order service offering over 2800 products from Spain, Argentina, Italy, Haiti, Columbia, and Mexico. [Exp. #172.]

Royal Citrus Co. *http://home.earthlink.net/~dbailey7/oranges.html* Growers, packers and shippers of Sunkist citrus worldwide. Riverside, CA, open to public. [Exp. #171.]

Ruggiero Ideas *http://www.ruggieroideas.com* Think Ruggiero ideas for home design, furnishings, and improvement. [Exp. #172.]

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- 104 Enhanced Keyboard
- Serial Mouse
- 14" SVGA Monitor, .28, NI

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$499

AMD K5-100MHz	$519
AMD K5-133MHz	$539
AMD K5-166MHz	$549

VALUE MULTIMEDIA SYSTEM

- Mini-Tower Case w/250W PS
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- 512K L2 Pipeline Burst Cache
- AMD K5-90MHz CPU
- Ball Bearing CPU Fan & Heatsink
- 16MB EDO RAM, 60ns Memory
- TEAC 1.44MB Floppy Drive
- 1.2GB EIDE Hard Drive
- 2MB PCI SVGA w/MPEG
- 6X IDE CD-ROM
- 16-Bit 3D Sound Card
- Deluxe Speakers
- 104 Enhanced Keyboard
- Serial Mouse
- 14" SVGA Monitor, .28, NI

AMD K5

$599

AMD K5-100MHz	$619
AMD K5-133MHz	$639
AMD K5-166MHz	$649

HOME MULTIMEDIA SYSTEM

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- Intel Triton 430TX 75-233MHz M/B
- 512K L2 Pipeline Burst Cache
- Intel P-100MHz CPU
- Ball Bearing CPU Fan & Heatsink
- 32MB EDO RAM, 60ns Memory
- TEAC 1.44MB Floppy Drive
- 2.1GB EIDE Hard Drive
- S3 Virge 3D 4MB Video
- 16X IDE CD-ROM
- Sound Blaster 16 PNP
- 33.6 Fax/Modem/Voice
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- Mitsumi 104 Keyboard
- Mitsumi Serial Mouse
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P-166MHz MMX	$969
P-200MHz MMX	$1079
P-233MHz MMX	$1169
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AMD K6-200MHz	$999
AMD K6-233MHz	$1189

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- 2.1GB EIDE Hard Drive
- Diamond S3 Virge 3D 2000 2MB Video
- 16X IDE CD-ROM
- Sound Blaster 16 PnP
- Diamond Supra 33.6 Fax/Modem/Voice
- 60 Watt Amplified Speakers
- Mitsumi 104 Keyboard
- Mitsumi Serial Mouse
- 15" SVGA Monitor, .28

AMD K6

intel inside

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P-166MHz	$999
P-200MHz	$1049
P-166MHz MMX	$1029
P-200MHz MMX	$1139
P-233MHz MMX	$1229
AMD K6-166MHz	$999
AMD K6-200MHz	$1069
AMD K6-233MHz	$1249

PROFESSIONAL MULTIMEDIA SYSTEM

- Mid-Tower ATX w/250W PS
- ASUS TX97 XE Triton TX 75-233MHz M/B
- 512K L2 Pipeline Burst Cache
- Intel P-166 MMX CPU
- Ball Bearing CPU Fan & Heatsink
- 32MB SDRAM 10ns Memory
- TEAC 1.44MB Floppy Drive
- 3.1GB EIDE Hard Drive
- Diamond Fire GL 1000 Pro 4MB SGRAM
- 24X IDE CD-ROM
- Sound Blaster 64 AWE
- Diamond Supra 56.6K Fax/Modem/Voice
- 180 Watt Amplified Speakers
- Keytronics 104 Keyboard
- Logitech PS/2 Mouse
- 15" SVGA Monitor, .28

AMD K6

intel inside

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P-200MHz MMX	$1439
P-233MHz MMX	$1529
AMD K6-166MHz	$1309
AMD K6-200MHz	$1379
AMD K6-233MHz	$1559

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24X IDE CD-ROM
Sound Blaster 64 AWE
Diamond Supra 56.6K Fax/Modem/Voice
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Logitech PS/2 Mouse
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INTEL P-II 300MHz	$2299

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4.3GB Ultra-Wide SCSI Hard Drive
Asus 3D Explorer 3000 4MB AGP
12X SCSI CD-ROM
Sound Blaster 64 AWE
US Robotics 56.6K Fax/Modem
180 Watt Speakers
Keytronics 104 Keyboard
Logitech PS/2 Mouse
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INTEL P-II 266MHz	$2529
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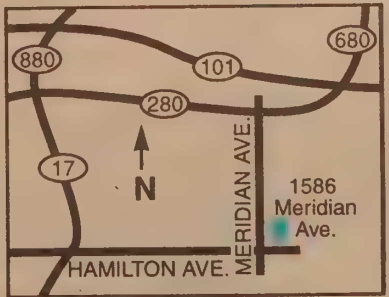

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[illegible]	P133MMX	161.35GB	12.1"TFT	[illegible]
[illegible]	P166MMX	32/2.1GB	12.1"TFT	[illegible]
[illegible]	P166MMX	32/2.1GB	12.1"TFT	[illegible]
[illegible]	P133	16/1.3GB	11.3"TFT	[illegible]
T-660CDT	P150	16/1.35GB	11.3"TFT	[illegible]
T-730XCDT	P150MMX	16/2.1GB	12.1"TFT	[illegible]
T-740CDTMMX	P166MMX	16/3.0GB	13.3"TFT	[illegible]

Port Replicators

PA2703U
[illegible] $175
PA2717U
[illegible] $480
PA2710UX
[illegible] V+ $695

COMPAQ Armada 4131T P133MMX, 16/1.4GB, 12.1" TFT [illegible]

Armada [illegible]	P166MMX	32/2.1GB	12.1"TFT	[illegible]
Armada [illegible]	P150MMX	16/1.6GB	12.1"TFT	[illegible]
Armada [illegible]	P133MMX	16/1.4GB	12.1"TFT	[illegible]
Armada [illegible]	P166	16/2.1GB	12.1"TFT	[illegible]
Armada [illegible]	P133	16/1.4GB	12.1"TFT	[illegible]
Armada [illegible]	P120	16/1.08GB	10.4"TFT	[illegible]
Armada 1120	P100	8/810MB	10.5"DSTN	[illegible]
LTE [illegible]	P150	32/2.1GB	12.1"TFT	[illegible]
LTE [illegible]	P133	16/1.3GB	12.1"TFT	[illegible]
Presario [illegible]	P166MMX	16/1.4GB	12.1"TFT	[illegible]
Presario [illegible] Prtbl.	P200MMX	24/3.8GB	12.1"TFT	[illegible]

[illegible] 17inch SVGA [illegible] Monitor $495

IBM ThinkPad 760ED* P150, 16/2.1GB, 6xCD, 12.1" TFT $2,795

ThinkPad 365E	586/100	8/540MB	10.4"TFT	$895
ThinkPad 365X	P133	8/1.08GB	11.3"DSTN	$1,295
[illegible]*	P120	8/810MB	10.4"TFT	$1,395
[illegible]	P150	16/1.3GB	12.1"DSTN	$1,950
[illegible]	P150	16/2.1GB	12.1"TFT	$2,895
[illegible]	P133	16/2.1GB	12.1"TFT	$2,995
[illegible]	P166MMX	16/2.1GB	12.1"TFT	$3,795
[illegible]*	P90	8/720MB	12.1"TFT	$1,495*
ThinkPad 760ED	P133	16/1.2GB	12.1"TFT	$2,695
ThinkPad 760XD	P166	32/3.3GB	12.1"TFT	$4,295
ThinkPad 760XL	P166	16/2.1GB	12.1"TFT	$3,395

PCMCIA 33.6 FaxModem $89

Apple® PB.3400C/240 603e/240, 48/3GB, 12xCD, 56K Fax, 12.1" TFT $4,745

PowerBook 3400C	603e/240	3GB	16MB	12xCD	$4,495
PowerBook 3400C	603e/200	2GB	16MB	12xCD	$3,495
PowerBook 1400C	603e/166	2GB	16MB	8xCD	$2,895
PowerBook 1400CS	603e/133	1.3GB	16MB	8XCD	$1,845
PowerMac 7300/200	604e/200	2GB	32MB	12XCD	$1,745
PowerMac 8600/300	604e/300	4GB	32MB	24XCD	$2,645
PowerMac 8600/200	604e/200	2GB	32MB	12XCD	$2,195
PowerMac 9600/300	604e/300	4GB	64MB	24XCD	$3,445
PowerMac 9600/200	604e/200	2GB	32MB	12XCD	$2,345

Apple LaserWriter [illegible] 16ppm, 600dpi/ [illegible] 12ppm, 600dpi $1,085/1,085

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NEW LaserJet 4000N/TN $1385/1575
LaserJet 5/5N $1050/1285
LaserJet 5M/5MP/6MP* $1545/625/485
[illegible] $368/475/689/865
LaserJet 4V/4MV* 16ppm, 11x17" $1,595/2,295
DeskJet 1600C*/CM* 9ppm, 600dpi $795/1,148

DeskJet 1600C $895
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D.Jet 1600CM $1,295

LaserJet 4V $1,595
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Web Page Listings *continued...*

Satellital InterWorld Communications Company, Inc. *http://www.satellital.com* We sell and ship worldwide Inmarsat satellite phone. [Exp. #172.]

Sell Your Civil Court Judgement *http://personal.bna.bellsouth.net/bna/f/g/fguzman/judgments.html* I buy civil court judgments on bad debt, back child support, divorce settlements, etc. [Exp. #173.]

Shotokan Karate Of America, Garden Grove, CA *http://inwinc.com/2003/garden.htm* Events, national Dojo directory, class schedule. Info about the history of Shotokan Karate of America. [Exp. #172.]

Shunsuky Consulting *http://www.t3.rim.or.jp/~shunsuky/* Online consulting service on love and marriage. [Exp. #172.]

Smile Doc *http://www.smiledoc.com/* Includes Ask the Dentist, featuring an extensive subject searchable archive of hundreds of dental questions and answers. [Exp. #172.]

Sourdough Baker *http://www.sourdoughbaker.com* Bakery: sourdough and traditional breads. [Exp. #173.]

Spa Cover Protector *http://home.inreach.com/spasoks/* Protects your spa cover from the fun. Five-year warranty. [Exp. #173.]

Sterling Assoc. *http://www.quikpages.com/S/sterlingassoc* Your source for rechargeable discount prepaid phone cards. [Exp. #172.]

Thomas Regional On The Internet *http://www.thomasregional.com* Searchable database of nineteen regional industrial buying guides. [Exp. #171.]

Toga Tees *http://www.togatees.com* A cyberspace-based entrepreneurial effort that markets and sells Latin phrase t-shirts from a Web site. [Exp. #172.]

Travelconexion *http://www.travelconexion.com* Travel industry suppliers, product promotions and services. [Exp. #171.]

Treasure Baskets To Go *http://www.tb2go.com* Eight years of experience meeting the needs of gift-givers with a variety of gift baskets and innovative gift ensembles. [Exp. #171.]

Victory Labs Supplements *http://purevictory.com/* Pure pharmaceutical-grade vitamins and supplements available to the public. [Exp. #171.]

Watermark Sales And Distribution *http://netnow.micron.net/~cbilyeu/watermark.html* Distribution and marketing of newly patented items. [Exp. #173.]

Woodturning: Treasures From Trees *http://www.indy.net/~woodturn* Woodturnings, woodturning, and lathe-related site by Dick Gerard, including a gallery of woodturnings for sale. [Exp. #171.]

FINANCIAL/ REAL ESTATE SERVICES

All Real Estate Ads *http://www.mswebmasters.com/land/* Interactive classified system listing homes for sale, businesses, farms, ranches, timeshare, farmland, condos, townhomes, orchards, rental property, all types of real estate. [Exp. #171.]

Ask Hubert *http://www.askhubert.com* Describes two new banking products. [Exp. #172.]

Castle Resale *http://www.castle-re-sale.com* Specializing in resale homes in Orange County since 1971. Worldwide referral and relocation, income properties and exchanges. [Exp. #173.]

Coldwell Banker Carl Conelly Realtors *http://www.cbsantacruzhomes.com* Real estate since 1934 specializing in rural, commuter, and estate homes, plus lots and acreage. [Exp. #171.]

Debt Consolidation *http://www.beevy.com/cfs/consolidate?45-9041* Help available for people who need a debt consolidation loan. No application fees. [Exp. #171.]

Financial Information Services Group *http://home.earthlink.net/~alexr/* Do-it-yourself bankruptcy kits by mail. [Exp. #172.]

Fleming Fund Management *http://www.fleming.lu* The leading cross-border provider of funds in Europe. [Exp. #173.]

Forecast Land Corp. *http://www.forecastland.com/Land* The definitive guide to financially successful land investment in Southern California. [Exp. #172.]

Hampton Roads Mortgage Link *http://www.mloans.com* Providing mortgage loan services for the home-buying public. [Exp. #171.]

Home Loans *http://www.dreamhomelone.com* The process of buying a home completely and clearly explained. [Exp. #172.]

Howard Perry & Walston/Better Homes & Gardens *http://triangle-hpw.com* Real estate marketing in North Carolina from the Triangle area to the Coast! [Exp. #171.]

Mergerstat *http://www.mergerstat.com* Mergers and acquisitions research. [Exp. #172.]

Personal Finance *http://www.geocities.com/wallstreet/floor/4551/blemieux.htm* Learn basic personal finance. [Exp. #171.]

Pivar Real Estate—Properties of St.Criox *http://www.pivar-stcroix.com* Pivar Real Estate of St.Croix in the Virgin Islands was founded to provide the very best real estate brokerage services. [Exp. #172.]

Tactical Asset Allocation *http://www.geocities.com/wallstreet/9250* Provides advice concerning which investments to emphasize based on current market conditions. [Exp. #171.]

Topanga Canyon Real Estate *http://www.topangacanyon.com* Comprehensive guide to real estate buys in this famous community by Topanga's leading brokerage, Coast & Canyon Realtors. [Exp. #171.]

LEGAL SERVICES

Claimtronics Network *http://claimtronics.com* A complete transportation claim processing service dedicated to the household moving industry. [Exp. #171.]

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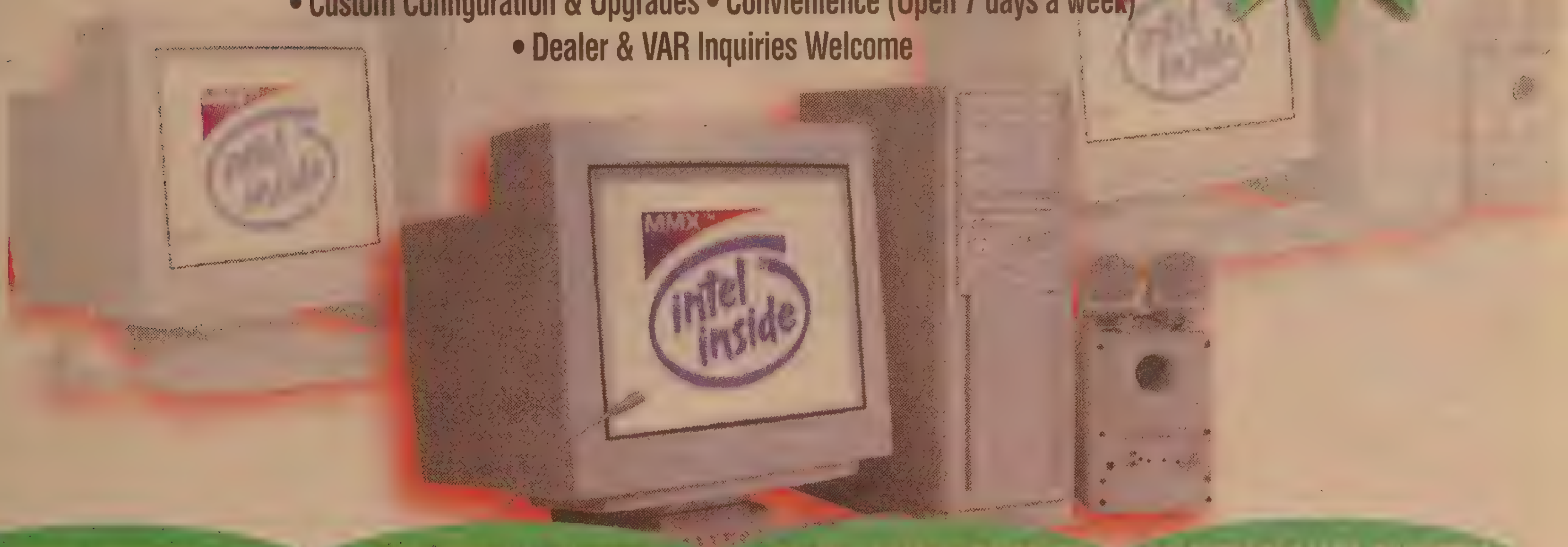

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- 104 Enhanced Keyboard
- Mouse
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- 104 Enhanced Keyboard ❖ Mouse
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- Sound Blaster 16 ❖ Amplified Speakers
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Seagate	4GB SCSI/UW	**649**
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	21" G810/21" P815	**1295/1629**
Sony	15" 100SX/100SF	**339/395**
	17" 200SX/200SF	**589/689**
NEC	E500/A700	**389/595**

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	890/1000C	**429/485**
	6Lxi/6Pxi	**389/749**
	5/5Si	**999/2475**
Epson	Stylus Photo/Color 800	**439/429**
	Stylus 1500	**669**

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ATI	3D Xpr 2/4MB	**$75/119**
	All-in-Wonder 2/4MB	**199/209**
Diamond	Stealth 3D 2000 2/4MB	**69/89**
	Stealth 3D 3000 2/4MB	**119/149**
Matrox	Millennium II 4MB/8MB	**195/279**
	Mystique 2MB/4MB	**99/139**

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Creative Labs	SB 16/64 PnP	**$59/89**
	Discovery 24X AWE 64	**259**
Mitsumi/Teac	24X CD-ROM	**89**
Toshiba	12X/16X/24 CD-ROM IDE	**79/89/99**
	12X/15X CD-ROM SCSI	**119/149**
Panasonic	8X CD-ROM SCSI	**120**
	24X CD-ROM IDE	**139**
NEC	16X CD-ROM SCSI	**139**

FAX/MODEMS

Hayes	56K Int/Ext	**$135/155**
Megahertz	33.6/56K PCMCIA	**199/259**
Supra	33.6/56K Int	**79/119**
US Robotics	56K Int/Ext	**160/190**
Motorola	56K Int/Ext	**99/139**

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CNet	NE2000	**$22**
3COM	3C509TPO/BNC	**59/89**
	3C509 Combo	**89**
	3C900/3C905 TP	**85/72**
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Computer Litigation Specialists *http://www.wsrcg.com* Consulting firm specializing in high technology and computer litigation support. [Exp. #171.]

First Legal Resource *http://www.findanattorney.com* Southern California's most complete Internet attorney directory. [Exp. #171.]

Law Offices of John R. Kahn *http://members.tripod.com/~jkahn/index.html* Attorney handling Computer, Bankruptcy, and Real Estate law, and transactional matters in San Jose, CA. [Exp. #173.]

Law Offices Of Karen K. Greig *http://www.kkglaw.com* Personal injury attorney for the 21st century—great use of technology for the benefit of clients. [Exp. #171.]

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Richard J. Greenstone, Attorney at Law *http://www.rjg.com/* Copyright, trademark, licensing, business, and transactional law for the computer, entertainment, and publishing industries. [Exp. #173.]

Walsh & Katz *http://www.welshkatz.com* A full-service intellectual property law firm. [Exp. #171.]

EMPLOYMENT/ EDUCATION

Acumen Systems *http://www.acumensystems.com* Excellent and affordable computer training and education. [Exp. #171.]

Annenberg/CPB Projects Learner Online *http://www.learner.org/* The Annenberg/CPB Project, founded in 1981, and the Annenberg/CPB Math and Science Project, founded in 1991, use electronic communications media to improve education for all Americans. [Exp. #172.]

Asia For Kids Educational Catalog *http://www.afk.com* Your best resource for language and culture. [Exp. #173.]

CAUPA *http://www.geocities.com/wureka/4648* A unique source for job seekers and established employees. [Exp. #171.]

College News Online *http://www.collegenews.com* Dedicated to connecting college students. [Exp. #172.]

Computer Learning Center *http://www.clcsj.com* Our flexible class schedules accommodate the needs of busy individuals. The Career Placement Department will assist you in finding your new career. [Exp. #172.]

Decolonization *http://www.trincoll.edu/~decol/* Decolonization: Painful Transitions in the Cold War Era. Trinity College, 1997-1998 program. [Exp. #171.]

EduTech *http://www.edutech-1.com* The largest online listing of K-12 certified and classified jobs in California education on the Net. [Exp. #171.]

The Lancaster Group *http://www.the-lancaster-group.com* Executive and technical search. [Exp. #171.]

Minorities Job Bank *http://www.minorities-jb.com* The first jobs Web site to target all people of color. Each village has content related to the interests, concerns, problems, and opportunities of each ethnic community. [Exp. #171.]

Mishu Online *http://www.cnmv.com/* Romanian college home page. [Exp. #172.]

Mr. Tutor *http://members.tripod.com/~russmccor/tutor.htm* Problem solving and tutoring for mathematics, chemistry, and english. Submit problems online—get answers and explanations. Membership fee. [Exp. #173.]

Park-Salinas *http://www.parksalinas.com* Specializes in placing sales/sales management for Fortune 1000 companies in the Bay Area. [Exp. #172.]

Smart And Smarter & Mystery Theater *http://www.smartandsmarter.com* Interactive geography and educational site. [Exp. #171.]

So Cal Job And Resume Bank *http://www.gojobs.com* Free job searching for jobs throughout Southern California. Free resume posting to newsgroups and recruiters. [Exp. #172.]

Technical Training Corp. *http://www.techtraincorp.com* Customized training programs. [Exp. #172.]

US Skill Center *http://www.usskillcenter.com* The specialist jobs and resume site for experienced computer professionals with expertise in Java, Oracle, PC's, SAP or UNIX. [Exp. #172.]

Visits For Pay *http://members.aol.com/visit4pay/paidvisits.htm* [Exp. #172.]

ORGANIZATIONS

Association For Quality And Participation *http://www.aqp.org* Non-profit for quality and participation. [Exp. #172.]

Association Of Macintosh Trainers *http://www.cyphernet.com/amt* The purpose of the association is to establish an international network of Apple Macintosh computer trainers, instructors and educators that is easily accessible to end-users and to help facilitate and improve upon the quality of Macintosh computer support. [Exp. #173.]

CHLB (Commodore/Apple Helpers Of Long Beach) *http://homepage.usr.com/c/camaron* Supporting Commodore 128/64/20/16/+4 and Apple II/IIC/IIE/IIGS computers. [Exp. #172.]

IBEW *http://www.ibew569.org* Labor union for electrical workers in construction, shipyard, low-voltage, and others in San Diego, CA. [Exp. #173.]

ICCA Silicon Valley *http://www.icca-sv.org* The public is invited to the regularly scheduled dinner meetings, fourth Tuesday of every month in San Jose. [Exp. #173.]

Insulin-Free World Foundation *http://www.insulin-free.org* For people with diabetes and for others interested in pancreas transplants, islet transplants, immunology and xenotransplantation as they relate to diabetes. [Exp. #171.]

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EExpress Pro 10/100 PCI 20Pk	1,447
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EExpress Pro 100 PCI Server card/5pk	511/2,373
OLICOM OC-2335 MCA 10/100 Fast Ethernet Card	240
SMC 9432 PCI Single/5/20/50Pk	89/420/1,620/3,604

Fast Ethernet Hubs

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ASANTE AsanteFast 12-pt 100 BaseT Hub	1,000
Friendlynet 16 100BTX	1,016
CISCO Fasthub 16 100BTX	828
COMPAQ Netelligent 1000 100BaseTX 8-port Hub	809
Netelligent 1124 24 port 100BaseTX Hub	1,462
Netelligent 1224 24 port Dual Speed Hub	1,736
HP AdvanceStack 12 100BTX/with MGMT	1,026/2,052
INTEL Express 8 port stand alone hub 100BaseTX	480
Express 10/100 Bundle(1 Hub, 10 Cards)	1,708
Express 10/100 Stackable Hub 12-pt/24-pt	1,135/1,776
MICRODYNE Eagle Century 6 Port 100BaseTX hub	364
NETGEAR FE104 4 100BTX/FE108 8 100BTX	192/385
FE508 8 100BTX Stackable/FE516 16 100BTX	590/1,034
SMC EZ Hub 100 8-pt 100BTX Hub	487
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3COM 3C319 TokenLink Velocity Single/5-Pk	230/1,104
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Smart 16/4 PCI TR card	302
PROTEON P1394+ Token Ring 16/4/10-Pk	232/2,280
SMC Token Ring Elite 16/4 Single/12-pack	220/2,431
Token Ring Elite passive MAU 8-PT/16-PT	400/608

PCMCIA/Card Bus/Parallel Port Adapters

3COM 3C589 PC Card 10BT/COMBO	137/186
3C689 PC Card TR/5-Pk	346/1,665
3C562D-TP PC Card Enet 33.6/Fax/5-Pk	274/1,285
3C575-TX PC Card XL 10/100/5PK	157/745
IBM PC Card Coax/TP Adapter	242/261
Turbo 16/4 TR PCMCIA2 Adapter	349
INTEL EtherExpress Pro/100 Mobile 16-BIT	172
EEPro/100 Mobile 16BIT 5PK/20PK	816/3,013
EEPro/100 Mobile 32BIT SINGLE	198
EEPro/100 Mobile 32BIT 5PK/20PK	902/3,350
XIRCOM Pocket Adapter III 10BaseT	291
Pocket ENET III COMBO(BNC & 10BaseT)	325
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PC Card Enet 33.6 Modem & Fax 10BT/Combo	340/380
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Ethernet Hubs/Concentrators

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Office Connect TP4 3C16704 4 10BaseT	63
Office Connect 8-pt Hub TPO/TPC/TPM	127/159/397
OfficeConnect 16 TP, 1 BNC	259
SuperStack II PS Hub 40 12-pt/24-pt	538/884
SuperStack II Hub 10 12-pt/24-pt	533/660
SuperStack II Hub 10 48 ports	2,196
SuperStack II 10 Mgmt Module/Redundant PS	466/1,032
SMC EtherEZ 8 port TP w/ BNC	99
ASANTE 8-Port w/AUI&BNC/12-Ports	122/242
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BAY NETWORKS CG1001E01 BayStack 12-pt	595

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AdvanceStack Switch Module for 12-pt or 24-pt Hub	662
AdvanceStack Management Module	350
AdvanceStack w/Mgmt Module 12-pt/24-pt	530/934

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3COM SuperStack II Switch 1000 12 10BT,1 100BTX	1,715
SuperStack II Switch 1000 24 10BT, 1 100BTX	2,340
SuperStack II Switch 3000 12-pt 10/100 Switch	2,350
SuperStack II Switch 3000 8-pt 100BTX	2,058
SuperStack II Switch 3000 5-pt 100BFX	6,022
SuperStack II Desktop Switch 24TP,1 100BTX	1,700
OfficeConnect Switch 140 4-10BT,1-100TX	745
ASANTE ReadySwitch 4 RJ45, 1 Fast Ethernet	1,253
IntraStack 6014 DSB 12 10/100 ports	3,437
BayStack 301 22 10BT, 2 100BTX	2,727
BayStack 302 8-10BT, 1-100BTX	1,772
BayStack 303 24 10BT, 1 10/100BTX	1,471
BayStack 304 12 10BT, 1 10/100BTX	996
BayStack 350T 16PT 10/100BaseTX switch	2,785
CISCO CATALYST1900 12 10BT/1 100BTX	2,008
24 TP,1-100BTX,1-100FX	3,525
CATALYST 1900 24 10BaseT,2-100BTX	3,083
HP AdvanceStack Switch 208 8-10BT,1-100BTX	780
AdvanceStack Switch 224 24-10BT, 1-100BTX	1,428
AdvanceStack 800T 4 100BTX, 4 Open	1,560
AdvanceStack 2000 6-slot chassis	1,776
AdvanceStack 2000 2 100BTX module J3191A	888
AdvanceStack 2000 4 10BT module J3102A	888
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FE-224 2-100TX, 24-10BT	1,306
FE-600 6-100TX Full Duplex	953
FE-600 + 5-100TX, 1 Open slot	1,574
NETGEAR SW510 8 10BT + 2 10/100BaseTX	738
SW518 16 10BT + 2 10/100BaseTX	1,109
FS102 2 10/100 + 2 uplink	252
FS104 4 10/100 + 1 uplink	458
FS508 8 10/100 + 1 uplink	1,223
SMC EZSwitch Plus 6-10BT, 2 100BaseTX	958
TigerSwitch 100, 8 port 10/100BaseTX switch	2,187
TigerSwitch 8+8TX, 8 10BT+8 100BTX switch	1,670

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Open File Agent for NetWare	426
SEAGATE Backup Exec 1 Server 25 Users	329
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C1599 DDS2 4mm 4-8GB DAT Int/Ext	840/940
C1553 24-48GB Autoloader Int/Ext	2,230/2,530
SONY SDT-9000 4mm DDS3 24GB Int/Ext	1,418/1,1506
SDT-9000 w/Arcserve Enterprise Int/Ext	2,379/2,432
TECMAR WangDAT 3900 DDS3 12-24 GB DAT Int	1,320
WangDAT 3900 DDS3 12-24 GB DAT Ext	1,440

Remote Access

3COM Office Connect Boundary Router 3C8841	1,247
Office Connect Remote 510 ENET,ISDN	586
Office Connect Remote 520U ENET, ISDN, POTS	733
Office Connect Remote 530U ENET, ISDN, ASYNC	1,100
ARTISOFT InSync Modemshare 1/2/4/8Pt.	108/187/348/592
CISCO 2501 1 ENET, dual serial router (software req)	1,906
2514 2 ENET, dual serial router (software req)	2,340
DIGI LANAserver 2E 2 Async	1,290
LANAserver 6E 4 PCMCIA slots; 2 Async	2,152
LANAserver 8E 8 Async	2,588
LANAserver 10E 8 PCMCIA slots; 2 Async	2,896
EMULEX Connect Plus 2 ports/8 Ports	582/2,262
NOVELL NetWare Connect 2	309
NetWare Connect 8/32 pts	1041/3,405
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Lanrover/E Async 8 Async/8 v.34 modems	3,655/5,355
DIGI INTERNATIONAL Digi 2-Pt/4-Pt/8-Pt	200/455/588
Acceleport 8EM w/RISC CPU, DB25 ISA/PCI	673/673

WAN Connectivity

3COM Impact IQ 3C882	275
ASCEND NetWarp 128 ISA Terminal Adapter	174
NetWarp Pro w/ POTS port	282
Pileline 15 w/ 2 POTS ports NT1	325
Pipeline 25-FX Bridging/ IP or IPX	480/721
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Pipeline 50 w/ 1 Lease 56 & 1 SW56	1,196
Pipeline 75 Multi IPX, IP, 2 Analog/ with Firewall	679/1,026
Pipeline 130 w/FT1,T1,ISDN	1,386
Pipeline 130 ISDN & L56/SW & L56	1,342/1,412
Max 200 Plus w/4 BRI Cards	3,043
CISCO 762 ISDN Rtr/Cisco 766 w/2 Analog Pts	544/668
Cisco 772 4-10BT/Cisco 776 4-10BT, 2 Analog	668/794
SHIVA Lanrover/E Plus 1-BRI ST, v.34, 3 CHAN	1,918
Lanrover/E Plus 2-BRI ST, 4 Channels, Enet	2,075
Lanrover/E Plus 4-BRI ST, 8 Channels, Enet	4,760
US ROBOTICS Sportster ISDN adapter	224
DataBurst Ext. Parallel Port ISDN w/NT1	275
Paradyne 7610 56/64K DDS CSU for Frame Relay	336
3150 T-1 Frame Relay CSU	1,157
ADC KENTROX D-SERV FrameRelay 56/64CSU/DSU	347
D-SERV FrameRelay up to T1 CSU/DSU	978

Internet Solutions

3COM OfficeConnect Gateway 535 ISDN IPX to IP	1,338
BAY NETWORKS 20 Usrs 1 Enet w/33.6k	1,896
Instant Internet 20 User, 2 Enet w/ 33.6 modem	2,086
Instant Internet 20 Users, 1 Enet w/ ISDN	2,200
Instant Internet 20 Users, 2 Enet w/ISDN	2,403
Instant Internet 10-User Add-On Pack/30 Users	379/2,734
100 Users w/ Dual-Enet & DDS support	3,657
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CISCO Microweb Server	907
FARALLON Netopia Internet Router IP/Appletalk	1,061
Netopia Internet Rtr TCP/IP 12-Users/.Unlimited	752/874
HP AdvanceStack Internet Router module J3138A	2,898
RAMP Networks WebRamp Entre	681
WebRamp IP ISDN Router/IPX Router	606/1,169
WebRamp M3 IP Rounter w/ 3 Serial ports	349

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3COM Office Connect Print Server (2P)	340
CASTELLE LANpress 3P/100 (10/100BTX)	374
HEWLETT PACKARD JetDirect 150X 1 port, IPX	172
JetDirect 10BT MIO	339
JetDirect Combo MIO BNC/10BT	400
JetDirect Card for 10/100Base-TX J2556B	407
JetDirect Ethernet EX Plus/ EX Plus 3	306/420
JetDirect Token Ring EX/EX Plus3	567/682
INTEL Netport EL Ethernet/Token Ring	422/588
NetportExpress XL for Ethernet/TR	415/565
NetportExpress Pro 10BT Int(MIO)/3 Pack	299/747
NetportExpress Pro 100 10/100BTX 1P/3Pack	273/739
NetportExpress Pro 100 10/100BTX 2P/1S/3Pk	396/1,068

Network Fax Solutions

3COM Office Connect Fax Server (1L)	1,277
CASTELLE FaxPress 1500 1-Line/2-Line	1,970/2,365
Faxpress 3000 2-line/FaxPress 3000 4-line	2,948/3,574
Faxpress 3500 2-line/FaxPress 3500 4-line	3,196/3,762
CHEYENNE FaxServe NLM 5/10/25	393/717/1,177
FaxServe NLM 50/100	1,816/2,533
FaxServe NLM 250	3,801
ZOOM Multiline 8 slot w/4 fax modems, hot swap	937
SYMANTEC Net Satisfaxtion 25/1000 users	742/990
Starter Kit (1 Server, 2 nodes)	258

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3COM OfficeConnect CDROM server	650
MICROTEST Discport Ethernet/Token Ring	410/791
Discport Pro w/ Discview ENET/TR	791
Discport XL ENET w/Discview Pro	779
Discport w/ 4CDROM in 7-Unit Tower	1,516
Discport w/ 7CDROM in 7-Unit Tower	2,008
Discport XL w/ 4CDROM in 7-Unit Tower	1,740
Discport XL w/ 7CDROM in 7-Unit Tower	2,232

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Smart-UPS 2200NET/3000NET	1,067/1,788
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AT10K Crimper Kit w/5 DIES & case	259
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MICROTEST Cable Tester	300
Penta Scanner w/Super Injector	3,019

E-Mail

MS Exchange Server Single w/ 5/10/25	1,014/1,368/2,160
Exchange Server Enterprise w/25/50 Clients	4,099/5,429
Exchange Add'l Clients 5/20	366/1,160
Exchange Internet Mail Connector	498

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3COM Transcend Workgroup Mgr for Windows	461
Transcend Enterprise Mgr for Windows	2,453
HP Openview Pro. Suite	1,037
INTEL LanDesk Mgmt Suite 5/10/100 users	522/696/4,240
LanDesk Server Manager Pro	1,232
NOVELL Lanalyzer for Windows	1,021
NetWare LANalyzer Agent Multi-Segment	1,178

Network Utilities

CHEYENNE AuditWare for NDS 100/Enterprise	460/851
Directory Mgmt. Combo/Enterprise	850/1,951
InocuLAN Wrkgrp/1Svr-Unlimited	301/648
InocuLAN 5 Svr-Unlimited Users	2,363
InocuLAN Option v4.0 for AS 6	313
INTEL LanDesk Virus Protect NW(Single)	1,024
LanDesk Virus Protect 4-pk/20-pk	3,460/14,438
ONTRACK Data Recovery NetWare	411
SEAGATE Prepare! Disaster Recovery SW	525

Server Mirroring

VINCA Campus Standby Server Software for NW	2,955
Standby Server NetWare/Windows NT	2,954/2,586
Entry StandBy Server/SnapShot Svr for NW	985/757
Standby Server Many-To-One	5,172

Windows NT Solutions

3COM Transcend Workgroup Mgr for NT	463
Transcend Enterprise Manager	2,353
CHEYENNE Arcserve for Windows NT v6.5, Single Svr.	320
Arcserve for Windows NT v6.5, Enterprise Edition	713
Arcserve for NT NetWare Agent	438
Arcserve Changer Option for Windows NT	365
Arcserve Disaster Recovery Option for NT	271
InocuLAN for Windows NT 1 Svr	651
Open File Agent for Windows NT	421
EXECUTIVE SOFTWARE Diskeeper/5-Pack	266/1,089
INTEL Landesk Workgroup Mgr 25	1,615
LANDesk Virus Protect NT	1,028
MICROSOFT Windows NT Workstation	317
Windows NT Server w/5/10 Clients	812/1,128
Windows NT Client Single/20 Clients	34/658
SMS System Mgmt Server w/5 Clients	943

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Web Page Listings *continued...*

KidsHealth At The AMA *http://www.ama-assn.org/KidsHealth* A Web site for children's health information, sponsored by the AMA and the Nemours Foundations. [Exp. #172.]

LAPA-NNJ *http://www.webspan.net/~lapa* We are a non-profit, volunteer adoptive parents association. [Exp. #172.]

Los Angeles Macintosh Group *http://www.lamg.org* Non-profit user group offers training programs, seminars, meetings, and tech support. [Exp. #172.]

Martinez Regional Land Trust *http://silicon.com/~mrlt/* Includes hikes for the SF Bay area. [Exp. #172.]

Middle East Childrens Alliance *http://www.peacenet.org/meca* Summer 1997 virtual delegation to Palestine and Israel. [Exp. #171.]

National Center For Employee Ownership *http://www.nceo.org/* Articles, columns, discussions, and interactive training on employee stock ownership plans, stock options, etc. [Exp. #173.]

North Shore Hematology/Oncology Associates, P.C. *http://www.mindspring.com/~nshoa* Suffolk County's oldest cancer treatment facility. [Exp. #171.]

Northern County Psychiatric Associates *http://www.ncpamd.com* Information about our group and useful mental health links for primary care physicians and the general public. [Exp. #171.]

PC Clubhouse *http://www.pcc.org* For people interested in learning more about IBM-compatibles. [Exp. #172.]

Peninsula Computer Club *http://www.serius.com/~jlo/* [Exp. #173.]

Point Mugu Navy Flying Club *http://www.geocities.com/CapeCanaveral/Lab/1594* Navy T-34 flying club located at the Camarillo, CA airport. Primarily training and recreational flying. [Exp. #173.]

Red Dog Fan Club *http://www.reddogfanclub.com* Golden Retriever merchandise and club. [Exp. #172.]

San Francisco FreeBSD User's Group *http://www.arachna.com/freebsd/freebsd-sf.html* Meets the second Thursday of every month in San Francisco to discuss "Turning PC's into Workstations." [Exp. #173.]

Santa Clarita Valley's PC Group *http://www.smartlink.net/~scvpcg* The Santa Clarita Valley's PC Group dedicated to PC literacy. Come join us. [Exp. #172.]

Santa Fe High School Vocal Department *http://members.aol.com/JPT411/home.html* This site has information on Santa Fe High School's vocal department, and concerts scheduled for this school year. [Exp. #172.]

Scripture Resource Center *http://scriptureresources.org* Catalog of various translations and versions of Scripture media. [Exp. #171.]

Silicon Valley Computer Society *http://www.svcs.org/sigs/inet.html* The Internet SIG of SVCS meets the first Monday of each month. [Exp. #171.]

Silicon Valley Localization Forum *http://www.tiziana.com/beta* Completely redesigned Web site. [Exp. #171.]

Technical & User Groups Network *http://www.tugnet.org* 24-hour bulletin board, meeting calendar, membership info., articles, reviews. [Exp. #171.]

USS New Orleans Reunion Association *http://www.purevictory.com/orleansindex.html* Looking for old ship mates of the USS New Or-leans. Visit the ship's reunion assn. page. [Exp. #171.]

Witness For Peace *http://www.w4peace.org/wfp* Witness for Peace is a faith-based, politically independent, not-for-profit organization dedicated to acting in accordance with principles of nonviolence. Our mission is to change US policies which contribute to poverty and oppression in Latin America and the Caribbean and to promote just alternatives. [Exp. #171.]

World Peace Campaign *http://www.worldpeacetreaty 2000.org* Promotion of Treaty for the Peaceful Settlement of International Disputes as the best hope for peace. [Exp. #172.]

List Your Web Page

To list your Web home page for FREE, send us the name of your page/site, the URL (address), and a fifteen-word description. Also, please include a contact name and phone number for our reference only. Listings will run for three issues unless renewed. We reserve the right to select listings on a space-available basis and to edit those listings as needed. Send us your listings to: *michael.robin@microtimes.com* ; Web Listings, 1300 Clay St., Ste. 820, Oakland, CA 94612; or fax to (510)768-1288.

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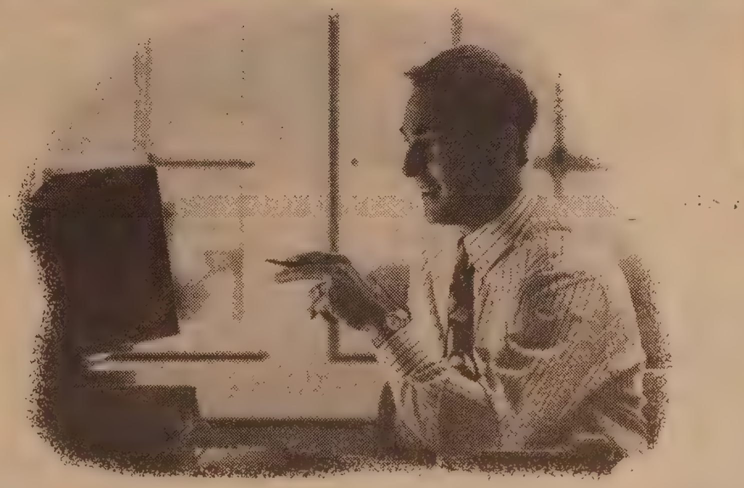

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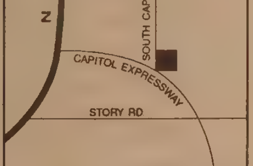

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GOVERNMENT/ POLITICS

Bureau Economique en France *http://www.cotedivoire.co* Site officiel du Bureau Economique: Paris and Washington. [Exp. #171.]

California Citizen *http://www.govnetworks.com* Acts as a clearinghouse of resources for California citizens, leaders, political candidates and elected officials. One of its goals is to help define the emerging models of citizenship and democracy in the Information Age. [Exp. #172.]

California Government, Business & Education Tech Expo *http://www.techconf.co* October 1-3, 1997 at the Los Angeles Convention Center. Highlights technology solutions for the public sector with up to 12,000 government, business and education professionals expected. [Exp. #171.]

City of Golden, CO Official Home Page *http://www.sni.net/cityofgolden* This is a municipal government site dedicated to providing improved service to the citizens of Golden, CO. [Exp. #172.]

City of Pasadena Planning and Permitting Dept. *http://www.ci.pasadena.ca.us/planning&permitting/index.html* Building/zoning code enforcement; design/preservation; general plan; commission meetings; neighborhood events; arts. [Exp. #172.]

Democracy Direct *http://www.well.com/user/kr2/car15.html* Reclaiming democratic representative government by giving the national and state electorates a meaningful and direct voice (not the last word) in state and national government. [Exp. #171.]

NAFED/BPEN Homepage *http://www.nafed.go.id* A service of NAFED, Ministry of Industry and Trade, Republic of Indonesia. [Exp. #171.]

Pasadena, CA Film Office *http://www.filmpasadena.com* City of Pasadena Film Office: scout hundreds of film locations online, film permits, application procedures, film history, and shoot schedules. [Exp. #172.]

Social Development Web Site Of Pakistan *http://www.digitalin.com/devpak* Pakistan's first Web site on social sectors. [Exp. #172.]

ARTS

Cannonball Express *http://www.best.com/~canonbal* A video project-in-progress about urban firestorms, fire safety and environmental issues. [Exp. #173.]

Collectible Photo Guide *http://www.negraphics.com/~collectables* A free collectible and antique photo guide for sport and non-sport collectibles. [Exp. #171.]

Digital Snapshot Of The Day *http://www.kurz.net/* A photo gallery of digital photo snapshots. Take a close look at the snapshot of the day, which is updated daily by Martin Kurz. Everyday life gives us the best subjects. [Exp. #173.]

Egypt Interactive/Egyptian Internet Resources *http://www.amarna.com/eir* A listing of links to sites related to the Middle East, especially Egypt, archaeology and museums. [Exp. #172.]

The E-Wall *http://www.geocities.com/SoHo/3672/* A virtual wall on which to hang your own art work. [Exp. #172.]

Gary Wagner Fine Art Photographer *http://www.garywagner.com* Fine art photography. [Exp. #173.]

Golden Gate Gallery *http://goldengategallery.com* Modestly priced art prints and originals by noted California artists, especially Don Irwin and Jane Gallagher. [Exp. #173.]

James Wilcox ArtWeb *http://www.armory.com/~james1* "Two men enter, one man leaves" are you brave enough? Only the strong shall survive! [Exp. #171.]

Mansoor's Imports *http://www.amarna.com/eir/imports/html.htm* Antique dealer in San Juan Capistrano, CA. [Exp. #172.]

Poems by G.A. Lee *http://members.tripod.com/~GALee* The poetry of this sensitive and gifted poetess/orator is now on the WWW. Ms. Lee's verses are finely scuptured emotional statements. [Exp. #171.]

Poetyc Soul's Home Page *http://www.geocities.com/Paris/LeftBank/3131* All original poetry, a photo gallery, awards, and links to teen magazines/ezines! [Exp. #172.]

Selected Poems, 1997 *http://members.aol.com/TerryMcCa/home.html* A page of enjoyable, edifying, and thought-provoking poetry. Updated frequently. [Exp. #173.]

Ted Alvy Cosmos Topper Home Page *http://pages.prodigy.com/FNJD74A* Art of '60s L.A. underground radio, rebop, beatniks, hipsters, hippies, zoot horn rollo. [Exp. #173.]

Tony Lee Photography *http://www.angelfire.com/ca/fotografo* Emotional, hand-created B&W photography during your Spanish vacation. [Exp. #172.]

Willie Robert Middlebrook *http://home.pacbell.net/wrmbrook/* Art is about communications. Visit the online gallery of artist/photographer Willie Robert Middlebrook. [Exp. #172.]

ENTERTAINMENT /LEISURE

Action Review With Icestorm *http://www.icestorm.com/action/* For the coolest movie reviews, previews, and cinematic essays turn to this award-winning Web site! [Exp. #172.]

Alcatraz: The Warden Johnston Years *http://www.alsirat.com/alcatraz.html* The story of Alcatraz in the days of the "Public Enemies," featuring original photos, documents, and biographies. Tales of escapes, strikes, punishment, and human dignity. [Exp. #172.]

continued on page 234

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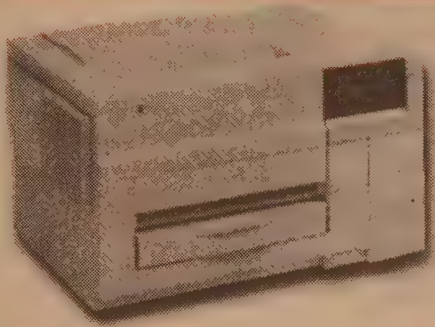

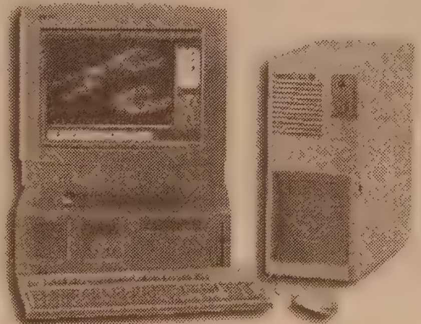

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HP DeskJet 1600C/ 1600CM Printer. $1269/1839
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HP LaserJet 6Pxi/6MP Printer $749/859
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HP LaserJet 4V/4MV Printer . . . $1785/2449
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HP LaserJet 5Si/5SiMX Printer. $2450/3329
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HP LaserJet 5/5N/ 5M Printer $999/1299/1529
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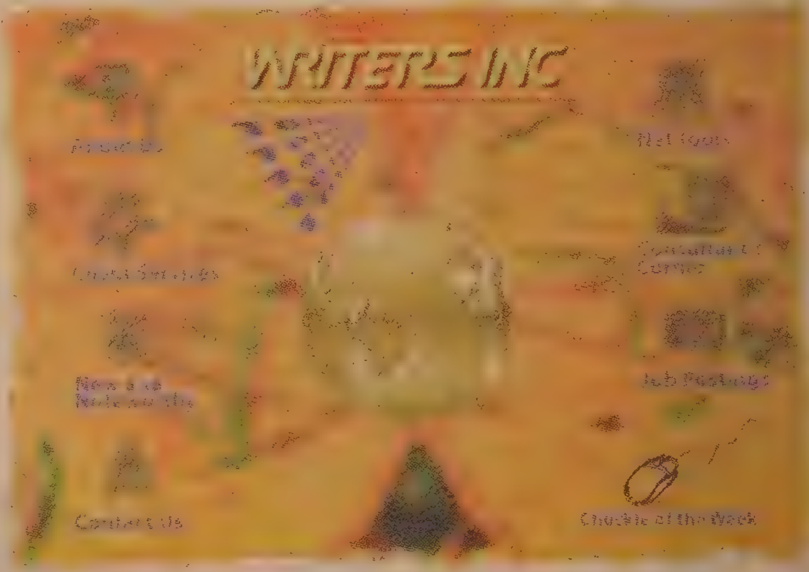
Gulch GOSSIP

by Jonathan E.

Writers Inc.

In my seemingly endless freelance writer's search for a crust to eat, even for a few crumbs fallen from the table of high technology, I was referred to the **Writers Inc.** agency of Oakland. So far nothing to eat has materialized from the connection—and, frankly, regular readers will probably be amazed at the thought of me hacking away at "marcom" material with my well-documented love of the idiocies epidemic within the business of high tech.

However, I was rather impressed with the Writers Inc. Web site at ***http://www.writersinc.com*** . So often we've heard the cliches about providing useful content to get people to your Web site and keep them coming back, and so often that content is absolute self-serving rubbish with no purpose beyond sticking the corporate name in your face. However, Writers Inc. took the cliche at face value and now delivers the goods.



Obviously enough, Writers Inc. has a niche site, and does not aim at providing entertainment for everyone but it does provide a lot of good information on the perils and promises of working freelance in the tech industry. There are tips on how to handle your taxes, working conditions, and how to make yourself more marketable as a tech writer. The history of Writers Inc. is outlined and its staff members are profiled. For sure, this is all helpful to Writers Inc. but the information can be used by anyone, whether working through the agency or not. In addition, you can register for work with the agency on the site; currently open opportunities are also listed. It's a good example of a functional corporate site that goes beyond the minimum, although not into anything flashy—indeed there's a certain soberness evident.

Writers Inc. did well at translating a slice of new media theory into practice. I will, of course, let all you faithful readers know if this glowing notice produces a future conflict of interest in the form of something to eat.

WASTED SPACE

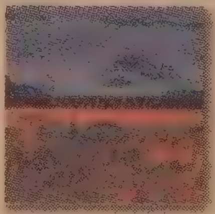
ONCE IN A WHILE, LIKE ABOUT every month, I get email from some person I knew in another lifetime, or at least in another lifestyle, announcing their arrival on the cyberstage and asking if I remember them. Recently, **James Brown** sent me such a message. No, not that one! This was the scrawny white guy one who worked with me at the **Rough Trade** record store about a gazillion years ago—alright, a decade ago.

Mr. Brown commanded me to check out his Web site, ***wastedspace.com*** , and now I politely suggest that you might do the same if you'd like to read some really quite good literary-type writing by an assortment of writers, mostly from San Diego. Not only is the writing good but the design is nice and clean. No multimedia bells or whistles, just simple, elegant text—and some inelegant thoughts along with elegant descriptions of inelegant acts.

Hearts Of Space vs. City Of Tribes

THANKFULLY, **HEARTS OF SPACE** has not launched a sublabel called **Hearts Of Cyberspace**, having the good sense instead to call its label devoted to deeper music **Fathom**. Over the past few months, Fathom has released a string of varied recordings.

FATHOM RECORDS



Robert Rich, one of the Bay Area's longtime electro-acoustic musicians, has a couple of albums out. One is a double-CD reissue of two of his classics, ***Numena*** and ***Geometry***, while the other is a new collaboration with **Alio Die** called ***Fissures***. It's rather more relaxing and serene than much of his work.

Steve Roach comes out with ***On This Planet***, a live-in-the-studio recording that he wants you to turn the volume up on. Suffice it to say that this is less relaxing and serene than much of his work—not that that's a bad thing.

Fathom also released **Tuu**'s third album, ***Mesh***, another fine blend of vaguely Asian acoustic sounds woven together with electronic atmospheres.

On what I suppose is Hearts Of Space's regular label, **Paul Sauvanet** has a almost totally digital release, ***Nomad***, leavened with voice and sax on a couple of tracks, generally evocative in a filmy sort of way of North Africa, but without all that gritty sand.

Meanwhile **Óystein Sevag and his Global House Band** do not play what most would identify as house music on ***Bridge***, but nonetheless it's a moving release combining elements of ambient, classical, jazz, and world music and featuring piano, violin, sax, guitar, and vocals along with **The Philharmona Orchestra London**. Not particularly cyber but a nice change if you're looking for something delicate and light. If you just want a taste of Hearts Of Space, there's also a new low-price sampler out, ***Universe 4***. More info from the Web site, *http://www.hos.com* .

City Of Tribes also has a couple of excellent new releases in its special niche of the music of the **Archaic Revival**. **Stephen Kent**'s ***Family Tree*** is a double CD, one of which is a collection of tracks from various of his endeavors over the past few years, including several previously unreleased tracks. The second consists of three didgeridoo-based pieces in the Deep Space meditative vein, with some electronics on at least one of the tracks; it's amazing how much you can hear in them after awhile.

Stellamara's first full-length release, ***Star Of The Sea***, came with high expectations after isolated tracks on a couple of compilations. It does not disappoint. Stellamara's sound is vaguely Middle Eastern/Eastern European, with prominent percussion at times and at others a very ambient quality, although **Sonja Drakulich**'s vocals are, as they say, powerful. It's the sort of music that seems to have taken very strong root around the fringes of the Bay Area's cyber arts scene; Stellamara's offering is among the most appealing releases of this year. City Of Tribes has a site at ***http://www.cot.com*** .

In This Section:

- **Gulch Gossip**
  By Jonathan E 176
- **Multimedia 101**
  Net Media—The Dream
  A Very Brief History Of Multimedia
  By Jonathan E 182

Get Your Face Into Interface Culture

NO TIME TO GIVE IT A LENGTHY REVIEW, BUT **STEVEN JOHNSON**'S ***Interface Culture***, newly published by HarperEdge, is a fascinating exploration of what happens when computers meet media and how we mere mortals both design the interfaces and are forced to use the wretched things. Many if not most of the recent wave of cyberthis and cyberthat books aren't worth the manuscript's disk space; *Interface Culture* is the exception. Johnson's great strength is that, although he obviously has enthusiasm for the technomedia wonders of the future, he also has deep knowledge of the past which he adroitly uses to illuminate the darker side of what may be coming up. If you're in the new media business, you don't deserve to survive for long unless you read this book.

INTERFACE CULTURE
HOW NEW TECHNOLOGY TRANSFORMS THE WAY WE CREATE AND COMMUNICATE

Scratching Away At The Maritime

MARITIME HALL'S DEBUT CD RELEASE ON ITS **2B1 RECORDS** LABEL OF **Lee '"Scratch" Perry**'s April performance there is now out. I was most excited by the first copy I received in the mail—it was really well and truly scratched, and sounded like totally mad dub. However, eventually it became rather unlistenable and I got another copy that plays as it should—but what a collector's item!

Reviews of the show were mixed, and likewise reactions to this recording will be mixed. It's far from the worst "Scratch" release around, and it's the only live-in-performance recording of him that I'm aware of, but it's not the sort of work upon which his reputation was built and for which he is adored by so many aficionados of sound manipulation, the sort of work discussed in this column several issues ago when reviewing **Island**'s triple-CD ***Arkology*** retrospective.

On the *Live At Maritime Hall* release, Perry gruffly boasts of his weirdness, occasionally lapsing into incoherence, over solid but hardly stellar backing in a style verging on rock rather than reggae from **The Robotics Band**, while **The Mad Professor** twists the knobs. Completists and fanatics will certainly want it but I can't see this attracting new listeners.

"Gossip" continued on page 180

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GULCH GOSSIP *continued from page 177*

Computers vs. Comedy

THE MID-SEPTEMBER **CYBERSALON WEST** ABOUT COMPUTERS AND comedy struggled hard to find anything funny or meaningful to say about the subject. Mid-September must be the end of the gestation period following the breeding season for cliches because cliches abounded—but most were pretty weak on their feet. Perhaps the biggest laugh came when a woman, whose name I didn't manage to write down but who certainly didn't look like the typical computer geek, announced that, "Computers give me an erection when I go up into Fred's studio." Later, she confided that she's attempting to trademark the term "Tech.Erection," which sounds like a thoroughly bad idea to me but might well appeal to a fetishistic outfit like ***Wired***.

A more cerebral and subtle—but still primal—take came from another speaker who shall also remain anonymous with the observation that "Microsoft can't stand one bit of competition." My two bits were that humor is a tool to make the intolerable tolerable, a way to let off steam, and that the aggravation caused by malfunctioning machines and obstreperous code makes humor a necessary safety device around computers. **Paulina Borsook** previewed a finely detailed story she'd written for ***San Francisco Magazine***, supposedly about misapplying tomorrow's technology today, but while full of accurate cultural observation about software culture and its consumerist toys and artifacts, its signifiers, it wasn't funny—more like sad, or at least poignant, in its attention to the techy trivia that clutters our lives.

The irrepressible **Bill Bates** came closest to the mark, demonstrating the underlying cruelty beneath so much humor, with his tales of the virtual human resources department from hell that he's set up to deal with the resumes that come flooding into his **Maczilla** shareware operation. It seems that in this **Dilbertian** world there are a lot of masochists out there just itching to work in a cube farm where prairie-dogging is a fireable offense. Bill did not tell his fine story about **Robin Williams** shilling **MacPlaymate** for him several years ago at **Macworld**, but he did reveal that the lawyers for **Godzilla** have been after him for his Maczilla plug-in. Guess what he told them? That Maczilla is a rip off of **Barney**, the purple one, not the scaly Japanese dinosaur. I asked him if I could print this, if he wasn't concerned that Barney's attack attorneys would attempt to tear off a piece of his flesh, he replied, "Sure, it's a joke, even an attorney could get it."

Go Where When?

THIS COLUMN WAS MOST AMUSED BY **BILLY GRAHAM AND FRIENDS'** appropriation of **Bill Gates'** slogan, "Where Do You Want To Go Today?" complete with the jagged, rigid digit of the Microsoft campaign. Billy gets a few extra points for his honesty in changing "Today" to "Tomorrow," a more realistic indication of when the promised attractions will actually be available.

It is good to see the continuation in this modern electronic age of the long-time Christian tradition of borrowing elements from other power structures; for example, most Christian holidays are based on pagan festivities and many saints on pagan gods. It must feel good for Bill to be recognized as such a power structure by Billy. We were also pleased to see that, just like the original Internet, all seats are free at the Billy Graham and Friends crusade. ■

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MULTIMEDIA 101

Net Media: The Dream

A Very Brief History Of Multimedia

Multimedia finally made it onto desktop personal computers in the mid- to late-'80s after its earlier appearance on the rock stages and in the art extravaganzas of the '60s.

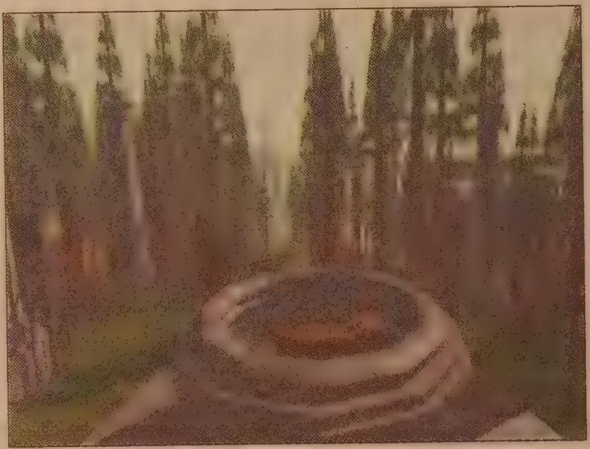
The new storage medium of CD-ROMs promised to make it viable to access relatively large sound files with a computer and the usually static graphical user interfaces of the time. Video on the computer screen was then still a far-off dream; color screens weren't even available for the typical consumer, although computers were often used to control the playback of laser discs on a television monitor.

Interest was primarily directed at educational uses—point-and-click interactivity was considered to be a useful brand new tool for reinforcing content, although clearly the large storage capacity of CD-ROMs was also attractive for such industrial or commercial uses as parts catalogs. There were a few games or "explorations" available, like *Manhole* from the Miller brothers, who later went on to create *Myst*.

And *Myst*, appearing in late 1993, was in some ways the next milestone for multimedia. By now, computers more commonly had color capabilities. QuickTime had also appeared, and so *Myst* had some video and a rich look, along with lots of interactivity in the form of clicking on things to trigger an animation, or to get you to another screen, or to play some music. Sound was used throughout *Myst* for ambiance, for storytelling, or as part of the puzzle. Beyond pure technical achievement, *Myst* worked aesthetically and touched an audience in a way that it liked. Multimedia had arrived!

Hysteria arrived along with it.

Myst was not alone in the marketplace. It was more like the tip of an iceberg. A tidal wave of hysteria and frenzy swirled around; digital multimedia was going to change everything! CD-ROM was the medium of the future! It was one of those delicious moments of euphoria when the blue-sky possibilities were unrestrained by any considerations of reality. Of course, reality soon caught up. While there were some fine CD-ROMs produced, there were thousands of titles not worth the plastic they were stamped on. The technical issues of producing a pleasing experience were not fully understood (and judging from the longer experience of producing other media, never will be).



A "milestone for multimedia:" the Miller brother's classic *Myst*.

The business of distributing this new medium stumbled badly over trade practices. Too much money was invested for too little return. The hoped-for audience's attention wandered.

But not very far; it only wandered about as far as the emergence of the Web.

Until now, all the hoopla had been about local discs, things that consumers could hold in their hands, things that had to be physically put in drives, shiny little things that were bounded in some way by that 650MB capacity. In contrast, the Web was worldwide (at least in

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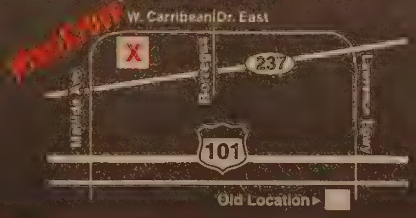

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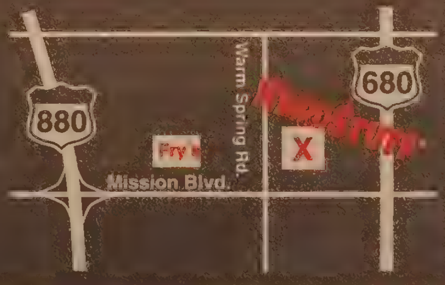


MULTIMEDIA 101 *continued...*

theory), virtually limitless, and, while initially text-based, it soon became the new multimedia gold rush because, as we've been endlessly told, "It's all digital—it doesn't matter whether it's text or sound or video."

TIME FOR REALITY CHECK, ONE, TWO

Except that it does matter. Sound takes up more digital space than text, and video takes up more digital space than sound. While digital space as a whole may be virtually limitless, the connection from all that digital space to your computer is not. In fact, it's really quite limited—not only by the speed of your modem, but also by all the packet-passing that's going on all over the Internet, and most especially by the load that your own ISP's server is under.

Originally, multimedia over the Web meant downloading files to your local drive and playing them from there. But that is, of course, pretty lame. And so, an assortment of so-called streaming media players soon appeared, most prominent among them Progressive Networks' RealAudio, which coughed and spat sound across cyberspace in something approaching real time. Progressive Networks has now updated RealAudio to RealPlayer with the hope of presenting online video live. However, I have yet to hear or see any audio or video streamed over the Web under consumer conditions of a 28.8Kbps modem that is consistent or that I would consider pleasurably acceptable.

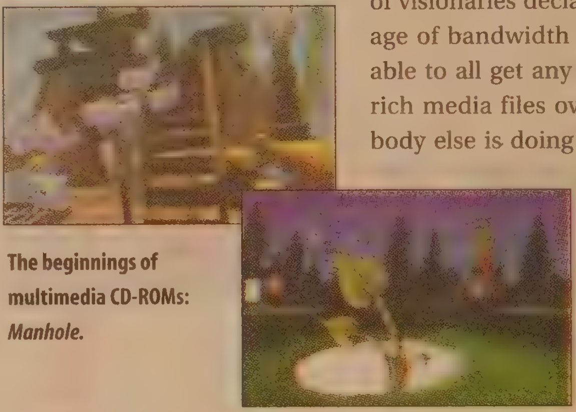
However, that hasn't stopped the starry-eyed, the hucksters, and some level-headed businessmen from declaring that the Web is a viable multimedia delivery vehicle, which means to a large extent being able to compete with television—being, in fact, the new television, and taking up the bandwidth to attempt to prove their point—and make a buck. The convergence of television and the personal computer is ongoing—and untested in any meaningful way.

Which is about as far as we've come in public today. Behind the scenes, in the labs and research centers, future technological marvels may well be being fashioned. However, despite the hopes and the hypes, there are obviously a few wrinkles still to be ironed out before Net multimedia becomes a cultural force—or commercial success—along the lines of, say, rock music over the past 40 years, Hollywood movies since the 1920s, books since some time before that. Let alone the pervasive influence that television has had almost since its first appearance—and, let's face it, after all the industry hype, it has to have that much to retain any credibility.

IRONING THOSE WRINKLES

One of the hopes and promises of digital multimedia over the Net is that it will level the playing field of who gets access to the masses. Not only will we all have our own printing presses with which to spread our opinions but, shades of *Wayne's World*, we'll have our own television stations.

However, quality media over the Net is basically just as expensive to produce as it is for any other medium—or at least it's not cheap. The Net offers both the advantage of relatively easy distribution and the disadvantage of making it hard as hell to get paid for it.



The beginnings of multimedia CD-ROMs: *Manhole.*

If the Web is to avoid the flash-in-the-pan fate of CB radio as a popular medium and be more than a giant bulletin board of jobs wanted, items for sale, academic reports, marketing opportunities, and chit-chat; if it is to continue to throw up all the weird and wonderful obsessions and dementia of the world's artistic and political fringes, it has to find a way to provide its creators with some sort of subsistence.

Advertiser support is not viable for any but full-scale professional outfits (who already have their printing presses and television stations) and does little for the artists and inspired amateurs who may not be doing what they're doing just to make a financial killing but who don't want, or can't afford, to be financially drained. Besides the culture of the Net being traditionally free, commercial systems for collecting payment do not come cheap.

Perhaps shareware will mutate from being primarily a support system for tool production to also become a way for media auteurs to see some return on their labors and inspirations. Perhaps Web sites will become like public TV stations and beg for support during pledge weeks. Micro-payments with e-cash? We'll see. But, for sure, if the Web becomes just another consumer wasteland of cyberspace storefronts, a virtual shopping mall (so far, please remember, a considerable driving force behind its current impetus), why bother? If it becomes just an ever-more effective way for advertisers to reach their prey—ads aimed specifically at you individually, immediate response with a mouse click, we'll probably be worse off than we are now.

The other wrinkle that gums up the works quite literally is that overarching concern of bandwidth. It is impossible to escape. Yes, loads of visionaries declare that there's a coming age of bandwidth glut, that we'll soon be able to all get any amount of great big fat rich media files over the Net while everybody else is doing the same thing. I really hope they're right. I hope that the subversive-of-big-media visions of Progressive Networks' Rob Glaser come true. I hope everything does scale up from today's clunky baling-wire-and-twine version to tomorrow's sleek networked world.

However, my guess is that there's a technical breakthrough or two, as well as a couple of economic ones, to be made before we see and hear what I would consider an authentic delivery system for multimedia over the Web to the general public. The current system of unicasting every packet to a particular address is obviously massively wasteful of bandwidth. Multicasting or the MBone, where packets are sent out only once to a session group of subscribers and duplicated wherever network paths split at routers, has been used for a few publicity stunts like Rolling Stones' cybercast, but is basically still a research and corporate platform and a long way from being available to the mass market.

One big drawback to the MBone is that it shares traditional broadcasting's real-time quality and so, if you ain't on the Net when the signal goes out, you've missed it. And it's hard to see how a genuinely on-demand system can be anything but unicast, so we're stuck with the need to build a huge infrastructure (or retool an existing one like the cable system) before video and audio over the Web in real time-shifted time to large audiences becomes feasible.

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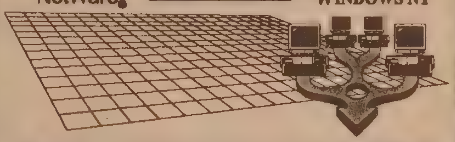

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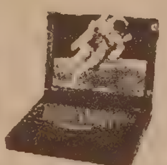

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MULTIMEDIA 101 *continued...*

LIGHT STARCH, PLEASE

Two other issues keep coming to at least my mind as needing to be solved before the full-scale Web-as-television mass-medium scenario comes to pass.

One is simply that there needs to be some stability at the consumer end of the line. Moore's Law is a wonderful thing, but spending $2,000 or so every couple of years on a new computer just to access a medium that is also running you perhaps $40 per month in phone and ISP charges is more attractive from the businessman's point of view than from that of the consumer. With expense of that scale, many consumers won't have any disposable income left to spend on whatever's advertised.

> **If the Web becomes just another consumer wasteland of cyberspace storefronts, a virtual shopping mall, why bother? If it becomes just an ever-more effective way for advertisers to reach their prey—ads aimed specifically at you individually, immediate response with a mouse click—we'll probably be worse off than we are now.**

Okay, perhaps in a few years' time we won't need the constantly new machine to keep up with the state of the art, our processors will be able to crunch full-screen, full-motion video along with whatever other new media we want with ease, and Circuit City will be competing with the Good Guys to sell a Net machine for a lousy $249. Or a full home-theatre PC system with fully immersive 3-D projected video, awesome sound, and a full-time Net link will go for only a couple of grand.

But the take-home point here is that the continual improvement and continual expense endemic to the computer industry is going to either have to go, at least slow down dramatically, or require a major marketing effort to convince consumers of its value before the number of homes with computers even begins to approach that of homes with televisions. Currently the number of homes with computers hovers around 40%, while about 98% of homes have televisions—and we are, of course, only talking about the United States Of America here.

The second issue that just keeps on wrinkling, whatever way I look at it, is the bifurcated one of time. Bifurcated because one-half is intimately connected with the issue of keeping up with the hardware as in the paragraph above, only here it's the matter of keeping up with the software.

Currently, the software is usually free to the consumer, and so the question of expense is not acute as it is with hardware. However, that software takes up vast amounts of time to make it work in conjunction with all the other lines of code on your machine. If by some chance your new software works fairly readily, there's a good chance that something else no longer works. There's a new version or you need something for a new MIME type every few weeks. Every download stretches over half an hour, installation and restarting the machine might run another fifteen minutes, debugging if you have problems, who knows?

In short, it's all a process much more suited for the hobbyist and the tinkerer than for someone who just wants to get a multimedia fix. Granted by the time the hardware settles down a bit, these problems with the software may also settle down. However, the time issue is bifurcated because once everything's working on your computer there's still the question of finding the time to check out all that multimedia.

If the Web ever does deliver real eye candy, it might be reasonable to assume that there will be hundreds, if not thousands, of Web stations to check into, all pumping out programming. So not only will they be competing with each other, but in this media-saturated world they'll also be competing with all the other distractions available—cable, broadcast, books, conversation and time with your family and friends, a quiet walk in the woods, even making your own media. There are only 24 hours in anyone's day and, even with an expanding population, if the number of media producers increases exponentially, some media producers are going to rapidly run into a time barrier of finding an audience.

As it is, I already do not have the time to look or listen to everything I would like to—and I know few, if any, people who are not under a continual time crunch of books unread, phone messages not returned, conversations not had, and Web sites ignored, even though they mean to, and really want to, get to them.

Personal time management of one's media immersion is the consumer's side of the coin the media producer hopes to mint in his or her search for an audience—and an avalanche of interactive multimedia over the Net is not going to make either the consumer's or the producer's tasks any easier. While the barriers of entry may be relatively low for the media producer, the question of how much media is too much may ultimately become a serious one as consumers turn off the virtual world in frustration, feeling that they simply can't keep up, and so why bother with any of it.

EXCUSE ME, THAT'S MY NICHE YOU'RE IN

Of course, television with its mass audience, incredibly inflated sense of its own importance, and equally low cultural values is not anything that any sane person without a financial interest actually wants to preserve. The dream of Net media, multi and otherwise, is that niche audiences (marketeers call them "communities") will develop and that the programming will be of a higher standard than what the current broadcasting mass-media model allows. While there are some good things to be said about the sense of social cohesion that limited sources of information encourage, the downside is the amazing dreck that passes for entertainment, along with the very obvious dangers of status quo propaganda. Clearly, on balance, widescale Net- or Web-based media are preferable.

However, the obstacles in the way of authentic multimedia Web-based niche media are not trivial, whatever the visionaries may posit. I'll remind you that it wasn't long ago that CD-ROMs were loudly proclaimed to be "the next big thing." Those predictions came to almost naught. Nearly everyone then climbed on the Web bandwagon; however, by several accounts,

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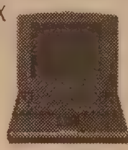

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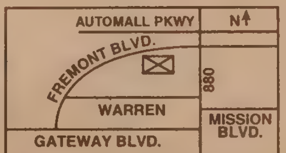

MULTIMEDIA 101 *continued...*

we're now about to see the long-rumored wave of Internet media company failures roll through the industry.

Meanwhile, new bandwagons are busily being built. There's a new wave of local media such as DVD-ROM about to enter the marketplace that really can deliver rich multimedia—although, of course, the same old problems of producing something worth spending your time with and distributing it continue to exist. The advent of cheap CD recording has some interesting implications, particularly when it comes to the music end of the multimedia spectrum. It's certainly an area where there's a lot of activity going on, although opinions about its implications are wildly varied. I'll be adding mine to the fray in a future Multimedia 101 column.

As always, the best advice I can give you is to not believe the hype—and, in this business, there's always something new on the horizon, something that's often described and has gone through a complete product cycle before it's even made a dent in the consumer world. Just because something is technically possible, doesn't mean it will be a cultural or financial success.

> **Moore's Law is a wonderful thing, but spending $2,000 or so every couple of years on a new computer just to access a medium that is also running you perhaps $40 per month in phone and ISP charges is more attractive from the businessman's point of view than from that of the consumer.**

Projections of the future are inherently risky. Just because something is growing like crazy right now, doesn't mean that rate of growth will continue. I'm not saying that Net media will disappear; as I said above, Net media is preferable for its plural points of view than the traditional three or four TV networks, although it is also true that the large news sites don't offer much in the way of radical opinions.

I'm just saying that Net multimedia is as yet an uncertain dream. As with all dreams, its resolution in the cold light of dawn is likely to be different from the first fuzzy longings under the warm covers of night. We're still in the dark—sometime just before 3 am, I'd guess. ■

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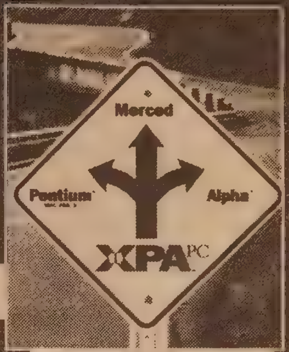

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Intel 166MHz MMX	$1,429
Intel 200MHz MMX	$1,549
Intel 233MHz MMX	$1,649

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Intel 233MHz CPU	$1,999
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Resources

Calendar Of Events

Conferences, Shows, Special Events

November

November 2 Livermore Amateur Radio Klub (LARK) Swap Meet. Las Positas College, Livermore. LARK. Contact: (510)783-2803, or (510)447-3857 (eves.).

November 2 MarketPro Computer Shows & Sales. Civic Auditorium, Stockton. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

November 2–5 IEEE Military Communications Conference (MILCOM '97). Monterey. Contact: (408)756-6196, *k_lukens@lmsc.lockheed.com* , or URL: *http://www.milcom97.com* .

November 3–5 Mercury Interactive World Wide Conference 1997. Walt Disney World, FL. Contact: 1-888-222-0073, or URL: *http://www.merc-int.com* .

November 4–8 IEEE Global Telecommunications Conference (GLOBECOM '97). Phoenix, AZ. Contact: (602)581-4297, or URL: *http://www.globecom97.agcs.com* .

November 8 Robert Austin Computer Show. Oakland. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

November 8–9 MarketPro Computer Shows & Sales. Cal Expo, Sacramento. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

November 13 The Jefferson Club Presents: "The New Intellectual Revolution: Decentralization, Entrepreneurship, and the Information Age." Palo Alto. Contact: URL: *http://www.ipser.com/jeffersonclub* .

November 13–15 The Fifth Annual Bionomics Conference: Living With Perpetual Evolution. San Francisco. Contact: (202)218-4633, *bionom@cato.org* , or URL: *http://www.cato.org/events/calendar.html* .

November 13–16 ISTE's Sixth International Conference on Telecommunications and Multimedia in Education (ISTE's Tel-Ed '97). Austin, TX. Contact: 1-800-280-6218, *teledreg@oregon.uoregon.edu* , or URL: *http://www.iste.org* .

November 15 Free Seminar: "Become A Skilled Cyberspace Investor." San Francisco. Contact: (415)673-9620.

November 15–16 MarketPro Computer Shows & Sales. Solano County Fairgrounds, Vallejo. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

November 17–21 Comdex Fall '97. Las Vegas, NV. SOFTBANK. Contact: (617)433-1500, or URL: *http://www.comdex.com* .

November 22 Robert Austin Computer Show. San Francisco. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

November 22 MarketPro Computer Shows & Sales. Sonoma County Fairgrounds, Santa Rosa. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

November 29 Robert Austin Computer Show. Oakland. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

November 29–30 MarketPro Computer Shows & Sales. Solano County Fairgrounds, Vallejo. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

December

December 6–7 MarketPro Computer Shows & Sales. Cal Expo, Sacramento. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

December 7 Livermore Amateur Radio Klub (LARK) Swap Meet. Las Positas College, Livermore. LARK. Contact: (510)783-2803, or (510)447-3857 (eves.).

December 8–9 Personal Technology Outlook. Burlingame. Contact: (212)343-1900, or URL: *http://www.tpsite.com* .

December 8–12 Fall Internet World '97. New York, NY. MecklerMedia. Contact: 1-888-746-9737, *bookit@mecklermedia.com* , or URL: *http://www.leetravel.com/iwfall/* .

December 13 Robert Austin Computer Show. San Francisco. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

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San Francisco State Multimedia Studies Program Job Fair

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December 14 MarketPro Computer Shows & Sales. Sonoma County Fairgrounds, Santa Rosa. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

December 20 Robert Austin Computer Show. Oakland. Robert Austin Corp. Contact: 1-800-243-7041 or URL: *http://www.robertaustin.com* .

December 20 MarketPro Computer Shows & Sales. Scottish Rite Center, Sacramento. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

December 21 MarketPro Computer Shows & Sales. Memorial Auditorium, Richmond. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

December 21 MarketPro Computer Shows & Sales. Civic Auditorium, Stockton. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

December 27–28 MarketPro Computer Shows & Sales. Solano County Fairgrounds, Vallejo. MarketPro. Contact: 1-800-708-7555 or URL: *http://marketpro.com* .

Classes, Seminars, Workshops

November

November 1 Intro To Macintosh Class. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

November 1 Overview of Multimedia. San Francisco. SFSU Extended Education. Contact: (415)904-7700, or URL: *http://msp.sfsu.edu* .

November 3 Director I: Introduction. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

November 3 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

November 3 Introduction to Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 3–17 Electric Image 1: Animation/Geometry. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 3–24 Computer Media Fundamentals. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 3–28 Kurzweil, Dragon and IBM Speech Recognition. San Mateo. Zephyr Training & Evaluation Company (ZTEC). Contact: (650)655-2405, or URL: *http://members.aol.com/zephyrbus/web/* .

November 3–4 Testing New and Advanced Technologies. Fremont. UC Berkeley Extension. Contact: (510)643-1492, or URL: *http://www.unex.berkeley.edu:4243/nation* .

November 3–4 Fundamentals of CGI Programming. Campbell. DeVries Data Systems, Inc. Contact: Alex Oka, (408)866-8033.

November 3–6 AutoCAD R14 Fundamentals Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com* , or URL: *http://www.copperconn.com* .

November 3–December 8 Multimedia Careers Self-Assessment Workshop. San Francisco. SFSU Extended Education. Contact: (415)904-7700, or URL: *http://msp.sfsu.edu* .

November 4 Introduction to PowerPoint for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 4–5 Java: AWT, Beans, and Applets. San Francisco. UC Berkeley Extension. Contact: (510)642-4111.

November 4–December 9 Managing Your Mac. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 4-7 Lotus and Domino Web Site Development. Santa Clara. Learning Tree International. Contact: 1-800-THE-TREE, or URL: *http://www.learningtree.com* .

November 5 Intermediate Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 5 Free Demonstrations: Kurzweil, Dragon and IBM Speech Recognition. San Mateo. Zephyr Training & Evaluation Company (ZTEC). Contact: (650)655-2405, or URL: *http://members.aol.com/zephyrbus/web/* .

November 5–19 Windows. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 6 Intermediate Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 6–20 Interactive Authoring: Lingo 1. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 6–7 Java: Networks, Threads, RMI, and Native Interfaces. San Francisco. UC Berkeley Extension. Contact: (510)642-4111.

November 6–8 PCB Design for Analog and RF. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com* , or URL: *http://www.copperconn.com* .

November 6–December 4 Painter 2. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 7 Introduction to PowerPoint for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 7–December 5 Color Pre-Press. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 10 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

November 10 Introduction to Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 10–12 Utilizing Frame Relay Networks. Santa Clara. Learning Tree International. Contact: 1-800-843-8733, (703)709-9019, or URL: *http://www.learningtree.com* .

November 10–12 Java Application Design. San Francisco. UC Berkeley Extension. Contact: (510)642-4111.

November 10–13 AutoCAD R14 Advanced 2-D Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com* , or URL: *http://www.copperconn.com* .

November 10–14 Java: Discovering Its Power. San Francisco. UC Berkeley Extension. Contact: (510)642-4111.

November 10–21 IMM Intensive. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 11–December 16 Director. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 11–December 9 3D Studio Max 1. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 12 Free Demonstrations: Kurzweil, Dragon and IBM Speech Recognition. San Mateo. Zephyr Training & Evaluation Company (ZTEC). Contact: (650)655-2405, or URL: *http://members.aol.com/zephyrbus/web/* .

November 12–December 10 Illustrator. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 12–December 10 QuickTime 1: Working with Digital Video and Premiere. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

November 14 Introduction to Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

continued on page 197

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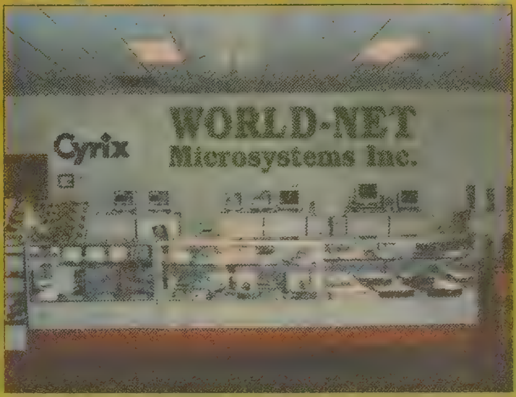

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ACS500 5 Channel 3pcs Sound Systems	$299
YAMAHA	
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M15 Speaker	$78
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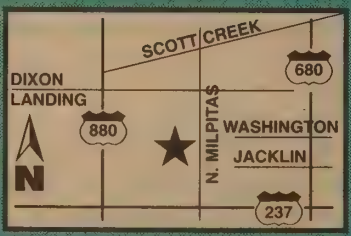

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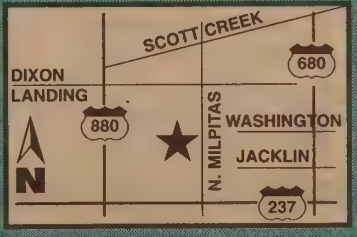

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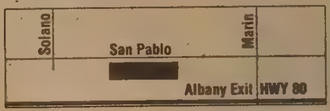

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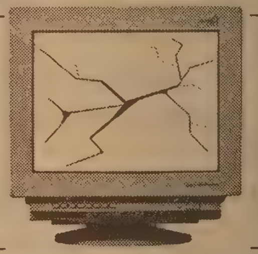

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Calendar Of Events *continued from page 192*

November 15 Introduction to Photoshop. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org*.

November 17 Director III: Shockwave. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org*.

November 17 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

November 17–20 Professional AutoCAD R14 3-D Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD @aol.com*, or URL: *http://www.copperconn.com*.

November 18 Introduction to PowerPoint for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 19 Intermediate Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 19 Creating Dynamic and Multimedia Web Sites. Campbell. DeVries Data Systems, Inc. Contact: (408)866-8033.

November 19–20 Systems Testing and Quality Assurance Techniques. San Francisco. Advanced Information Technologies. Contact: 1-800-882-8684, or URL: *http://www. iqpc.com/ait*.

November 20 Introduction to PowerPoint for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 20–21 Visual Site Design Using NetObjects Fusion 2.0. Campbell. DeVries Data Systems, Inc. Contact: (408)866-8033.

November 20–December 18 A Method for User-Centered Interactive Media Design. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu*, or URL: *http://www.cea.edu/*.

November 20–December 18 Portfolio Pre-Production. San Francisco. SFSU Extended Education. Contact: (415)904-7700, or URL: *http://msp.sfsu.edu*.

November 21 Introduction to Word for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 21–December 12 QuarkXPress 1. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu*, or URL: *http://www.cea.edu/*.

November 24 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

November 24 Introduction to Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 24–25 AutoCAD R14 Update Workshop for R12 Users. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD @aol.com*, or URL: *http://www.copper conn.com*.

November 24–December 15 The Production Process. San Francisco. SFSU Extended Education. Contact: (415)904-7700, or URL: *http://msp.sfsu.edu*

November 25 Intermediate Excel for Windows Class. Walnut Creek. Computer Education Center. Contact: (510)937-2566.

November 25–December 16 Visual Design 3. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu*, or URL: *http://www.cea.edu/*.

November 26 AutoCAD R14 Update Workshop for R13 Users. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD @aol.com*, or URL: *http://www.copperconn.com*.

November 26–December 17 Creating Your Demo Reel. San Francisco. SFSU Extended Education. Contact: (415)904-7700, or URL: *http://msp.sfsu.edu*.

November 29 Advanced Photoshop. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org*.

continued on page 221

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408

El Observador. (408)372-9054. Free Internet/Usenet. Text, humor, literature, rants, coffee, UFOs, and more. NIRVANAnet. [Exp. #176.]

Escape To Other Worlds BBS. (408)956-1745. 24 hrs., 28,800. Meet other people online through our matchmaker or online games. [Exp. #176.]

Hacker Heaven BBS. (408)375-5455. 24 hrs., DOS, CP/M, Commodore, Atari, TRS80, etc. Experimental code forum, and support for older computers. Email and more. All welcome. Free. [Exp. #171.]

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Ultimate Force. (415)441-1120. 8-N-1, 24 hrs., 300–19,200. Online games, multi-message bases, files, 1.2GB. Only comlink network in Northern CA. Free access. [Exp. #171.]

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& the Temple of the Screaming Electron. (510)935-5845. Full access on first call, seven lines, chat rooms, encryption, tattoos, phone info, drug questions answered, huge BBS list, NIRVANAnet, Contra Costa Net, free. [Exp. #176.]

Windows OnLine. (510)736-8343, Telnet: WOLLY.WOLNET.COM , URL: *http://www.wolnet.com* . 8-N-1, 24 hrs., 33,600. Largest Windows BBS. Free limited trial. [Exp. #176.]

Wishing Well BBS. (510)745-7901. Up to 28,800. Over fifty-five registered online games, quality files, ANSI & RIP graphics, L.O.R.D., family board, free access! Sysop: MaryLou White. [Exp. #171.]

650

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Peninsula Computer BBS. (650)571-9259. 8-N-1, 24 hrs., 2400–28,800. GT Power Network v1900; email; nearly 2,000 files: DOS, OS/2, shareware, door games for callers. Sponsored by the Peninsula Computer Club. FREE BBS. URL: *http://www.sirius.com/~jlo* . Sysop: Bob Wallace. [Exp. #176.]

The Benchmaster's BBS. (650)473-3980. 8-N-1, 24 hrs., 28,800. Files and messages for the Amiga computer only. Free. [Exp. #176.]

The Floor Show. (650)952-3231. Messages, files, games. Full access at first call. No validation. No ratios. Novices welcome. Free. Sysop: Donna. [Exp. #175.]

707

Monkey Glands. (707)542-5587. Linux-based system in Santa Rosa. No validation, free. Sysop: Magic Man. [Exp. #176.]

USER GROUPS

AMIGA

AWEST–Amiga Users In SF. Meetings: 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission St. (near Ocean), San Francisco. Call: (415)474-1164; BBS (415)441-1120. [Exp.#176.]

TOGA–The Other Group Of Amigoids. Meetings: 4th Sat., 12:30 pm, Milpitas Community Library Meeting Room, 40 N. Milpitas Blvd., Milpitas. An informal group to share ideas, PD software, and information. Free. Contact: Randy Abel, (408)356-9405 or *rabel1@dsp.com* ; Warren Burnham, (408)252-3406 or *wburn46506@aol.com* ; URL: *http://www.calweb.com/~rabel1* . [Exp.#176.]

ATARI

ABACUS–Atari Bay Area Computer Users Society. Meetings: 1st Sat., 1:00 pm, Potrero Branch Public Library, 2nd floor, 1616 20th St., San Francisco. Supporting all Atari computers and video games systems. Call: Roger Sinasohn, (415)469-7924, BBS (415)564-8062. [Exp.#176.]

San Leandro Computer Club. Meetings: 1st Tues., 8:00 pm, San Leandro Main Library, Estudillo Room, 300 Estudillo Ave. Call: Robbie, (510)797-5636. [Exp.#175.]

CAD

San Francisco 3D Studio User Group. Check Web site for location, date, subject and other information. URL: *http://www.sf3dsug.com* [Exp.#175.]

COMMODORE

CHUG (Commodore Hayward User Group). Meetings: 2nd Sat., 2:00–4:00 pm, Palma Ceia Park Clubhouse, Hayward. Commodore 64 and 128 owners are welcome to attend. Call: (510)793-7868. [Exp.#175.]

CWEST–Commodore 64/128 Users In SF. 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission (near Ocean), San Francisco. Call: (415)474-1164; BBS (415) 441-1120. [Exp.#176.]

Diablo Valley Commodore Users Group. Meetings: 3rd Thurs., 7:00 pm, Clayton Valley Presbyterian Church, 1578 Kirker Pass Rd., Clayton. Call: (510)689-3224. [Exp.#176.]

FUNHUG (Fremont, Union City, Newark, Hayward User Group). Meetings: 3rd Thurs., 7:30 pm, Newark Public Library, 6300 Civic Terrace Ave., Newark. For the Commodore 64/128 computer. Call: (510)793-7868. [Exp.#176.]

IBM AND COMPATIBLES

AT&T Computer Users Group. Meetings: 1st Wed., 7:00 pm, 50 Fremont St., 40th Floor (near 1st and Mission), San Francisco. Demonstrations, technical support, informal discussion. Call: (415) 885-6631. [Exp.#175.]

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Berkeley PC Users Group—BPCUG. Meetings: 2nd, 3rd, and 4th Tues., 7:00 pm, Winner's Circle Systems, 2618 Telegraph Ave., Berkeley. Public domain library, newsletter, and separate Beginners Special Interest Group meeting. Contact: Mel Mann, (510) 526-4033 or *melmann@aol.com*. [Exp.#176.]

Business Operations SIG of the Software Forum. Meetings: 1st Thurs., 7:00 pm, Palo Alto. Free to members, $10 for non-members. Contact: Brian Tien, *brian@leansoft.com*. [Exp.#175.]

Diablo Valley User Group—DVPC. Meetings: 1st Thurs., 7:00 pm, Bank of America, Bldg. B, 2001 Clayton Rd. at Galindo, Walnut Creek. SIGs include Internet, Windows, Beginner's, Visual Basic, education/entertainment, and more. Call: Craig Peterson, (510)556-1449, *bod@dvpc.org*, or URL: *http://www.dvpc.org*. [Exp.#175.]

East Bay FOG. Meetings: 2nd Wed., 7:30 pm, Episcopal Church of St. John-in-Montclair, 1707 Gouldin Rd., Oakland. All microcomputers, MS-DOS, CP/M. Call: (510) 653-2627, 8 am–10 pm. [Exp.#175.]

Napa Valley PC Users Group. Meetings: 2nd Wed., 7:30 pm. Guests welcome. Call: Lee Schwab, (707)257-2675, *programs@nvpcug.org*, or URL: *http://nvpcug.org/* for details and location. [Exp.#176.]

PC Clubhouse. Meetings: 1st Fri., 7:30 pm, swap at 7:00 pm, Meiklejohn Hall, Room 2002 (inside 1009), CSU Hayward. Learn more about your computer. Product demos. Member help. Call: (510)538-2449, (510)276-6450, or URL: *http://www.pcc.org* [Exp.#176.]

San Francisco PC Users Group. Meetings: 3rd Tues., 7:30 pm, PUC Auditorium, 505 Van Ness Ave./McAllister. Presentations, Q&A sessions. Call: Jerry Stern, (415)572-1100 or 777-1332 for recorded events message. URL: *http://www.sfpcug.org/~group*. [Exp.#175.]

Stanford Palo Alto Users Group For PC (SPAUG). Meetings: final Wed., 7:30 pm, Conference Center at EPRI, 3412 Hillview, Palo Alto. All welcome. Call: Bev Altman, (415)368-9530 or 329-8252. [Exp.#176.]

INTERNATIONAL

International Macintosh Users Group (IMUG). Meetings: 3rd Thurs., 7:00 pm, Apple Computer, R&D Campus, 1 Infinite Loop, Cupertino. A forum for multilingual/multiscript computing. $2; free for IMUG members. Call: Roger Sherman, (415)859-5146. [Exp.#171.]

International Software SIG Of the Software Forum. Meetings: 4th Mon., 7:00 pm, Palo Alto. Free to members, $10 for non-members. Contact: Charlie Pfefferkorn, *charliep@crystal-media.com*. [Exp.#175.]

INTERNET

Internet Development SIG Of The Software Forum. Meetings: 4th Tues., 7:00 pm, San Francisco. Free to members, $10 for non-members. Contact: Scott Rozic, *scott@sfsoftware.com*. [Exp.#175.]

Internet SIG of the Association of Database Developers (A.D.D.). Meetings: 3rd Tues., 7:00 pm, CyberWorld Cafe, 526 Folsom St., San Francisco. Contact: Patrick Lynch, (510)482-5329, 482-5752 (fax), *patl@a.crl.com*, or URL: *http://www.well.com/user/add/cal.htm*. [Exp.#175.]

Internet SIG Of The Software Forum. Meetings: 2nd Wed., 7:00 pm, Palo Alto. Free to members, $10 for non-members. Contact: Dave McClure, *daveaslan@msn.com*. [Exp.#175.]

SVCS Internet SIG. Meetings: 1st Mon., 7:30 pm, Baker's Square Restaurant, 2910 El Camino Real, Santa Clara. Contact: URL: *http://www.svcs.org/sigs/inet.html*. [Exp.#176.]

LEGAL

SF Bar Assoc. WordPerfect User Group. Meetings: 3rd Wed. odd-numbered months, noon, 465 California St., 11th floor, Boardroom. Chair: Al Buchignani. Call: (415) 421-5650. [Exp.#175.]

MACINTOSH

Association Of A32 Users. Meetings: 2nd Sat., 10:00 am–noon, Sunnyvale Community Center Arboretum, 550 E. Remington Ave (near the corner of El Camino and Fair Oaks). A non-profit computer users group (Mac, Newton and other GUI). Q&A session; guest speakers and vendor demonstrations; shareware, freeware, and PD software disks. Call: (408)881-0790, BBS: (408) 378-8252. [Exp.#175.]

Diablo Valley Macintosh User Group (DVMUG). Meetings: 3rd Tues., 7:00 pm, Bancroft Elementary School, 2200 Parish Dr., Walnut Creek. Call: Tom Bacon, (510)945-4548 or URL: *http://www.designlink.com/dvmug* [Exp.#175.]

The Gay Macintosh User Group (GMUG). Meetings: 4th Thurs., 7:30 pm, St. Francis Lutheran Church, 152 Church St., San Francisco. We have answers to your Mac-related questions and members can win free software. Contact: (415)552-GMUG, or URL: *http://www.gmug.org*. [Exp.#176.]

TriValley Macintosh User Group (TMUG). Meetings: 3rd Tues., 7:30 pm, Sonoma School, 543 Sonoma Ave., Livermore. Q&A, DOM, vendor presentations. Book, CD, MacAcademy training libraries. Free to public. Call: Jerry, (510)830-8838. [Exp.#176.]

MISCELLANEOUS

Bay Area Interleaf Users Group (Bayleaf). Meetings: 2nd Weds., odd-numbered months, Location varies; see Web site for details. Contact: Marilyn Salyer, (415)802-2170, *msalyer@interleaf.com*, or URL: *http://www.clearlink.com/bayleaf*. [Exp.#171.]

FileMaker Pro Database Interest Group (DIG.FM). Meetings: 3rd Thurs., 7:00 pm, Claris Corp., 5201 Patrick Henry Dr., Santa Clara. Presentations, demos, and tips by and for passionate users of FileMaker Pro for both Mac and Windows. Not affiliated with Claris. Free. Contact: *info@digfm.org*, or URL: *http://www.digfm.org*. [Exp.#176.]

Marketing SIG Of The Software Forum. Meetings: 2nd Mon., 7:00 pm, Palo Alto. Free to members, $10 for non-members. Contact: Stan Trumbull, *strum@bayarea.net*. [Exp.#175.]

MS Access Peninsula User Group. Meetings: 2nd Fri., 1:00 pm, Metro Center Building, 9th floor, Foster City. All welcome from beginners to professionals. Contact: URL: *http://www.rampage.net/accdocs/sigs/htm* [Exp.#175.]

PACGUG—Palo Alto Computer Game User Group. Now accepting members. $20/year membership fee. Contact: *kkp@accuserve.net*. [Exp.#175.]

Society for Technical Communication. Meetings: 3rd Weds., 6:00 pm, London Wine Bar, 415 Sansome St., San Francisco. For technical writers and editors. Newsletter, annual competition. Non-members, $12. Contact: (415) 985-7121, URL: *http://stc.org/region8/sfc/www*. [Exp.#175.]

MULTIMEDIA

Multimedia SIG Of The Software Forum. Meetings: 4th Thurs., 7:00 pm, Cubberly Community Ctr., 4000 Middlefield Rd., Rm. H-1, Palo Alto. $10. Contact: Mike Schmit, *mschmit@compcore.com*. [Exp.#171.]

NETWORKING

EBNUG (East Bay Netware User Group). Meetings: 3rd Thurs., 6:30 pm, Bayer Auditorium, 800 Dwight Way, Berkeley. Contact: (510)705-5543; for more information, contact Andy Zutler at (408)524-2600 or *AZutler@Radiolan.com*. [Exp.#175.]

continued on page 204

Is Your Listing Missing?

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Free BBS listings are limited to the board's name, phone number, hours, baud rates, parameters, and a ten-word description. Please let our readers know if your BBS is free or requires a fee. Because we have an ongoing problem of boards shutting down without telling us, much to the annoyance of would-be callers and the new phone number's owner alike, we will **delete these listings after they've run three months.** The notice at the end of the listing—Exp. #xxx—refers to the last issue number it will appear in unless renewed.

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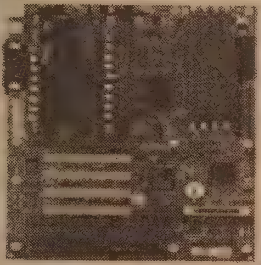

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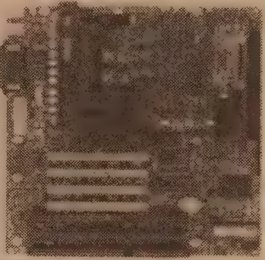

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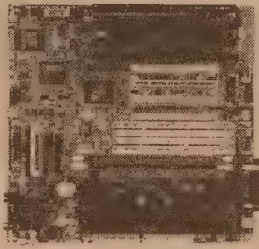

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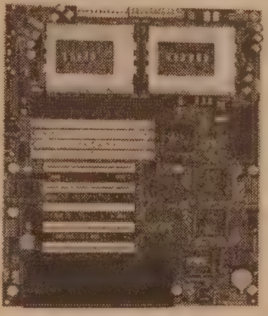

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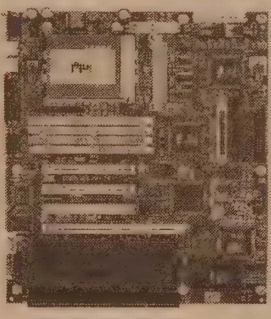

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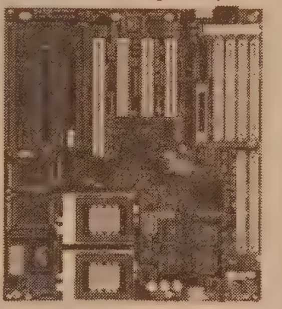

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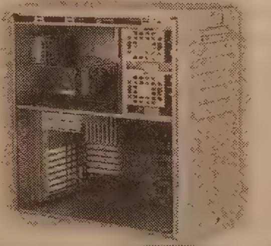
- *64MB/60ns/EDOMemory
- *12xSpeedSCSICD-Rom
- *Teac1.44MBFloppydrive
- *PCISVGAw/1MBDRAM(upto2M)
- *3Com10/100BaseTPCINetworkcard
- *Microsoft2-BottomPS/2Mouse
- *Keytronic104KeysKeyboard
- *Full-TowerATorATcasew/250WP.S

DualPro-180Mhz,w/256k	$1589
DualPro-200Mhz,w/256k	$2179
Add2.1GBUltra/WideSCSI3	$275
Add4.3GBUltra/WideSCSI3	$375
RaidARO-1130(forRaid0,1,5)	$239



Dual Pentium Server
- *AIRP55TDPw/DualPentiumCPUReady
- *2940Ultra/WideSCSI-3,w/40MB/Sec
- *64MB/60ns/EDOMemory
- *12xSpeedSCSICD-Rom
- *Teac1.44MBFloppydrive
- *PCISVGAw/1MBDRAM(upto2M)
- *3Com10/100BaseTPCINetworkcard
- *Microsoft2-BottomPS/2Mouse
- *Keytronic104KeysKeyboard
- *Mid-TowerATXcasew/250WP.S

DualPentium-100/133Mhz	$1289/$1329
DualPentium-166/200Mhz	$1399/$1499
Add2.1GBUltra/WideSCSI3	$275
Add4.3GBUltra/WideSCSI3	$375
RaidARO-1130(forRaid0,1,5)	$239

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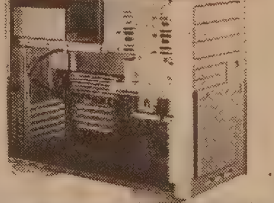
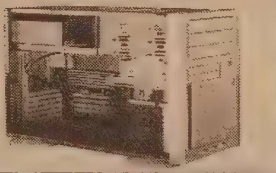


Windows 95 Station
- *AIRP54TXIPentium/AMDK6CPU
- *2xUltra/DMA/IDE,w/33MB/Sec
- *16MB/60ns/EDOMemory
- *24xSpeedIDECD-Rom
- *Teac1.44MBFloppydrive
- *PCI3DSVGAw/2MBDRAM
- *3Com10/100BaseTPCINetworkcard
- *Microsoft2-BottomPS/2Mouse
- *Keytronic104KeysKeyboard
- *Mini-TowerATXcasew/250WP.S

AMDK6-166/200/233	$629/$709/$Call
CyyrixM2-166+/200+	$599/$639
Pentium-100/133Mhz	$589/$609
Pentium-166/200Mhz	$639/$689
Pentium-166/200/233	$659/$779/$879
Add2940UWSCSIcard	$125
Add2GBUltra/WideSCSI3	$275

Antec KS-180



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Intel EtherExpress Pro 100 PCI w/Twisted Pair	$62
3COM PCI Fast Etherlink XL/100 BaseTX	$66
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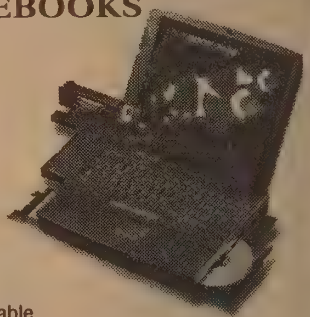
PCMCIA 56K Fax/Modem	$148
PCMCIA Network Card Combo	$75
Upgrade to TFT Active Matrix	$480
Upgrade to 32MB Memory	$65
Extra Battery, Li-Ion Battery	$85/99

MDI/CHEMBOOK 6800 NOTEBOOK

- Pentium® Processor w/512K Cache
- Toshiba 2.1GB Hard Drive
- 16MB Memory
- 12.1' Dual Scan Screen
- 16X CD-ROM/Speakers/Microphone
- 800x600 16M True Colors
- 64-Bit PCI w/Graphics Accelerator
- Tree Type II or Two Type II and One Type III
- Modem Ring in Wake-Up on Power Management
- Built-in 1MB Mask ROM Hardware Wavetable
- Infrared IrDA and PIR/RCA Jack for TV-Out
- Hi-Tech Battery/Carrying Case/AC Adapter

Model	Price
Pentium® 133MHz	$1589
Pentium® 200MHz MMX	$1699

MDI/CHEMBOOK 2600 NOTEBOOKS



- Intel Pentium® CPU w/MMX up to 233MHz
- Intel Mobel Triton II 430TX Core Logic
- 12.1" Dual Scan Display
- 16MB Memory
- Full Duplex Sound /2nd/3rd Hard Drive
- 20X CD-ROM Drive, Removable
- Toshiba 2.1GB Slim Hard Drive
- 64-Bit PCI Video Controller with Graphics Accelerator
- EDO Memory up to 128MB • 2MB EDO Video Ram
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- 2 Type II or 1 Type III PCMCIA • CardBus & Zoomed Video
- 16-Bit Stereo/3D Sound System with Hardware WaveTable
- Hi-Tech Battery/Carrying Case/AC Adapter

Model	Price
Pentium® 200MHz MMX	$1748
Pentium® 233MHz MMX	$1838

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- Pentium® Processor w/512K Cache
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- 20X CD-ROM/Speakers/Microphone
- 800x600 16M True Colors
- 64-Bit PCI w/Graphics Accelerator
- Tree Type II or Two Type II and One Type III
- Modem Ring in Wake-Up on Power Management
- Built-in 1MB Mask ROM Hardware Wavetable
- Infrared IrDA and PIR/RCA Jack for TV-Out
- Hi-Tech Battery/Carrying Case/AC Adapter

Model	Price
Pentium® 200MHz MMX	$2839
Pentium® 233MHz MMX	$2929

MDI/CHEMBOOK 2700 NOTEBOOK

- Intel Pentium® CPU w/MMX up to 233MHz
- Intel Mobel Triton II 430TX Core Logic
- 14.2" TFT Display
- Toshiba 2.1GB Slim Hard Drive
- 16MB Memory • 4MB EDO Video RAM
- 64-Bit PCI Video Controller with Graphics Accelerator
- SRAM Memory up to 128MB
- 2 Smart Bays, Supports 2nd & 3rd Hard Drive
- 20X CD-ROM Drive, Removable
- 2 Type II or 1 Type III PCMCIA
- CardBus & Zoomed Video
- 16-Bit Stereo/3D Sound System with Hardware WaveTable
- Hi-Tech Battery/Carrying Case/AC Adapter

Model	Price
Pentium® 200MHz MMX	$3088
Pentium® 233MHz MMX	$3178

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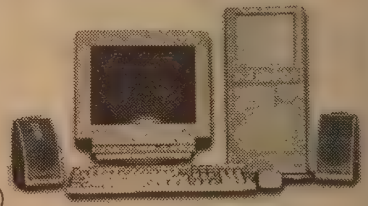
Intel i430 VX Motherboard / 512K Cache
16MB Memory EDO 60ns
1.7GB Fujitsu Hard Drive
1.44MB Floppy Disk
S3 3D w/2MB Memory Video Card
Mid Tower Case w/250W Power Supply
104 Windows 95 Keyboard / Serial Mouse (Mitsumi)
16X CD-ROM IDE, Yamaha 3D Sound Card, Win 95
33.6K Internal Fax/Modem
60W Speaker
Main Brand 14" NI .28 1024x768 Monitor

Model	Price
Pentium® 133 System	$788
Pentium® 200MMX System	$938
Pentium® 233MMX System	$1048

5 Year Labor Warranty

PENTIUM® II 300 /NETWORK SERVER



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1.44 MB Floppy Disk
3.5GB Hard Drive
Diamond 3D 3000 Super VGA Card w/4MB
ATX Mid Tower Case w/250W
24X CD-ROM IDE, Win 95
Yamaha 3D Sound Card, 120W Speaker
104 Windows 95 Keyboard / Serial Mouse (Mitsumi)
56K Internal Fax/Modem w/Voice

Model	Price
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Pentium® II 266 System	$1598
Pentium® II 300 System	$1758

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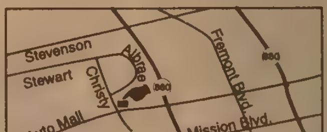

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- Intel Heat Sink & Cooling Fan/Alarm B/B
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- Seagate 2.2GB Barracuda Ultra Wide SCSI 8MS 7200RPM/512K
- Adaptec 7880/2940UW Ultra Wide PCI SCSI Controller
- 2 Hi-Speed (16c550 Fast UARTs) Serials & 1 Enhanced Parallel
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- Matrox Millennium II 3D 4MB WRAM VGA Card
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- Logitech 3 Button Combo Mouse
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- NEC 16X Speed SCSI 100ms 2400KB CD-ROM
- Creative Lab Awe 64 Value PnP Stereo Sound Card
- US Robotics Sportster 56 S/R Fax Modem
- Surround Sound 240W Speaker System w/Subwoofer

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Pentium® II Processor 266/233MHz w/Microstar M/B	$2,811/2,700
Pentium® II Processor 266/233MHz w/Tyan M/B	$2,807/2,695

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- Intel PD 440FX Chipset
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- Diamond Stealth 3D Virge 4MB EDO DRAM w/MPEG Screaming 64 Bit Graphics
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- Keytronic 104 Windows 95 Keyboard
- Logitech 2-Button PS-2 Mouse
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- Toshiba IDE 24X Speed 90ms 3600KB CD-ROM
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- Optiquest's V773 17" .26NI 1280x1024 Monitor
- Qtronix 104 Windows 95 PS-2 Keyboard
- Logitech 2-Button PS-2 Mouse
- Deluxe ATX Form Medium Tower Case 230W UL CSA Power Supply
- Toshiba IDE 24X Speed 90ms 3600KB CD-ROM
- Crystal 16-Bit Sound Card On Board
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- 32MB 60ns EDO RAM Up To 128MB
- Adaptec 2940UW Ultra Wide PCI SCSI Controller
- Quantum 3.2GB Ultra SCSI 5400RPM/128K Hard Drive
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- Impression 5VX 15".28NI 1280x1024 Digital Monitor
- Keytronic 104 Windows 95 Keyboard
- Logitech 2-Button PS-2 Mouse
- Deluxe ATX Form Medium Tower Case 235W UL Power Supply
- NEC 16X Speed SCSI 100ms 2400KB CD-ROM
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- Mitsumi 1.44MB 3.5" Floppy Drive
- Techmedia 14".28NI 1024x768 60Hz Monitor
- S3 Trio 64 V+ 1MB w/MPEG Screaming 64-Bit Graphics
- Qtronix 104 Windows 95 Keyboard-Serial
- Qtronix 2-Button PS-2 Mouse
- Deluxe Mini Tower Case 230W Power Supply
- Toshiba IDE 24X Speed 90ms 3600KB CD-ROM
- Opti Full Duplex Stereo Sound Card w/3D
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- Impression 33.6 V.34 S/R w/Voice Fax Modem

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AMD K6-166MMX	$924
Cyrix 6x86MX-PR200/166	$933/889
Cyrix 6x86-P200/P166	$861/855
Pentium® Processor-233MMX	$1,168
Pentium® Processor-200MMX/200	$1,061/968
Pentium® Processor-166MMX/166	$948/922
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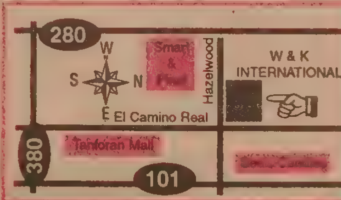

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continued from page 200

OS/2

OS/2 Bay Area User Group. Meetings: 4th Mon., 7:00 pm, Stanford Linear Accelerator Center Auditorium, 2575 Sand Hill Rd., Menlo Park. Free to members, non-members $3. Presentations, demonstrations, technical discussions. Call: (510)945-7565 ext. 100, or URL: *http://www.davebsoft.com/os2baug* [Exp.#175.]

PROGRAMMING LANGUAGES

Berkeley Java Users Group. Visit bjugNET to find out why we live, breathe, and speak Java. Meetings twice a month in Berkeley. Contact: *tpc@bjug.net* . [Exp.#175.]

Delphi SIG Of The Software Forum. Meetings: 2nd Weds., 7:00 pm, North Bay. Free to members, $5 for non-members. Contact: Bjarne Winkler, *nts4618086@aol.com* . [Exp.#175.]

Fox-VFP SIG of the Association of Database Developers (A.D.D.). Meetings: 1st Thurs., 7:00 pm, 124 Beale St., mezzanine level, San Francisco. Contact: Dean Lesner, (415)788-4366, *dlesner123@aol.com* , or URL: *http://www.well.com/user/add/cal.htm* . [Exp.#175.]

Java SIG of the Association of Database Developers (A.D.D.). Meetings: 1st Wed., 7:00 pm, 124 Beale St., mezzanine level, San Francisco. Contact: Mark Carranza, *mc2@surf. com* , or URL: *http://www.well.com/user/add/cal.htm* . [Exp.#175.]

Java SIG of the Software Forum. Meetings: 1st Mon., 7:00 pm, Cubberly Community Ctr., 4000 Middlefield Rd., Rm. H-1, Palo Alto. Free to members, $10 for non-members. Contact: Tom Hill, *javasig@worldware.com* . [Exp.#175.]

Visual Basic–San Francisco SIG of the Software Forum. Meetings: 3rd Thurs., 6:30 pm, San Francisco. Free to members, $10 for non-members. Contact: Bill Storage, *storage@nerve-net.com* . [Exp.#175.]

Visual Basic–Silicon Valley SIG of the Software Forum. Meetings: 2nd Thurs., 6:00 pm, Palo Alto. Free to members, $10 for non-members. Call: Allan Colby, *acolby@guidex.com* . [Exp.#175.]

VRML SIG of the Software Forum. Meetings: 3rd Tues., 7:00 pm, Mountain View. Contact: Katherine Bretz, *kbretz@fsc.fujitsu.com* . [Exp.#175.]

TEXAS INSTRUMENTS

TI-99/4A. Meetings: 2nd Sat., Oakland. Need programs/hardware? Call: Fred, (510)530-8335. [Exp.#175.]

WINDOWS

Windows NT Engineering Association of Silicon Valley (NTEA). Meetings: 2nd Tues., 6:00 pm, Santa Clara County Office of Education building, 1290 Ridder Park Dr., San Jose. Idea exchange, new technology, job opportunities. Meetings will focus on design, set-up, and troubleshooting servers, system administration, and software development issues. No fee for first-time participants. Contact: (408) 437-8803. [Exp.#176.]

Windows SIG Of The Software Forum. Meetings: 1st Weds., 6:30 pm, Palo Alto. Free to members, $20 for non-members. Contact: Fran Finnegan, *fran@fomci.com* . [Exp.#175.]

ASSOCIATIONS

Association For Women In Computing. Meetings: 1st Wed., 6:00 pm, Standing room only, Crocker Galleria, 50 Post St., San Francisco. $10 members, $15 guests. Call: (415)979-8450. [Exp.#176.]

Association of Database Developers (ADD-SF). Barbara Paltiel, (415)345-0152, *barbara@paltielinc.com* , or URL: *http://www.well.com/user/add/cal.htm* . [Exp.#176.]

ICCA Silicon Valley. Meetings: 4th Tues., 6:00 pm, Hobbee's Restaurant, 920 Town and Country Village (Steven's Creek/across from Valley Fair Mall), San Jose. Regularly-scheduled dinner meetings, $25 non-members/$20 members. Contact: Paul Stith, (408) 439-0870, ext 2, *info@icca-sv.org* , or URL: *http://www.icca-sv.org* [Exp.#177.]

Society of Technical Communications, Silicon Valley Chapter. Meetings: 4th Tues., Objectives are to advance the arts and sciences of technical communication. Includes San Mateo, Santa Clara, and Santa Cruz counties. Contact: Gwen Johnson, (408)285-7942, or *Johnson_Gwen@tandem.com* . [Exp.#176.]

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CLASSIFIED INDEX

Page
Accessories 206
Bar Coding 206
Business Opportunities 206
Cartridge Refill 206
CAREER MARKETPLACE-
General 219
Career Opportunities 219
Job Training. 219-220
Training 221
CONSULTANTS NETWORK-
General 216-217
LAN. 217-218
Programming. 218
Video Processing 219
Data Conversion 206
Data Recovery 206-207
Duplicator Hardware. 207
Graphic Design 208
Hardware 209
Hardware Testing 209
Hardware Wanted. 209
IC Programs. 209
Internet 209-210
Internet Adult 210
Investigative Services 210
Media Duplication. 210
Memory. 210
Monitors for Sale. 212
Office Supplies 212
Personals. 210
Printer and Computer Supplies . . . 212
Repairs 212
Services 215
Software 215

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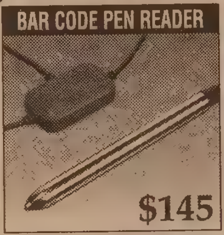

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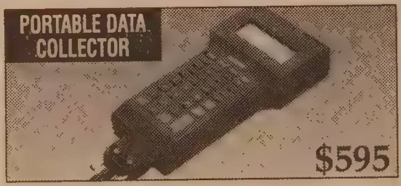

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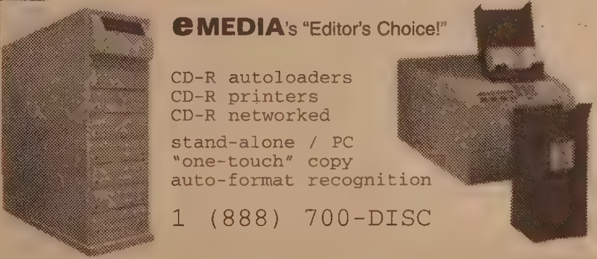

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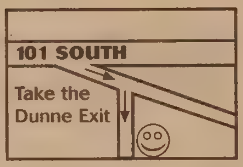

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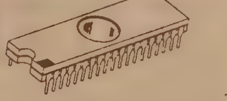

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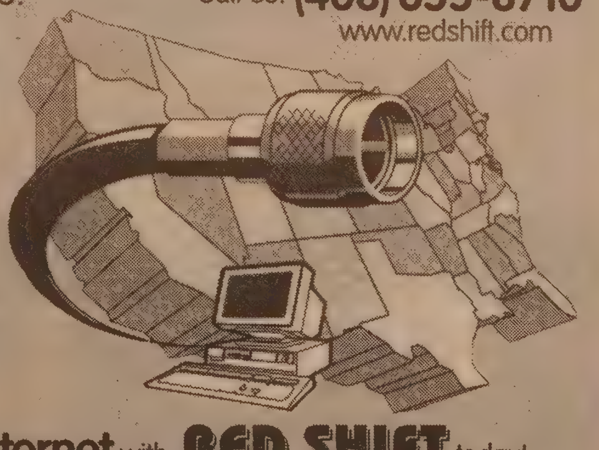

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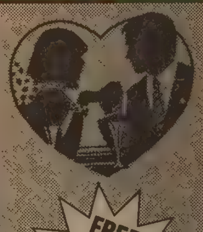

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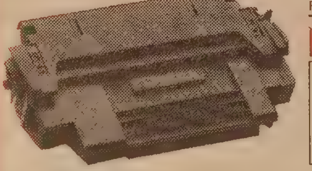

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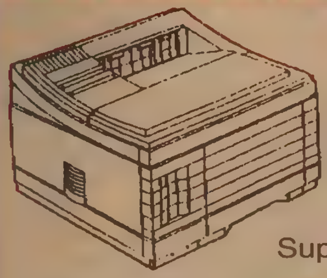

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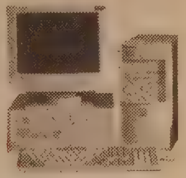

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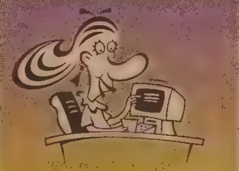

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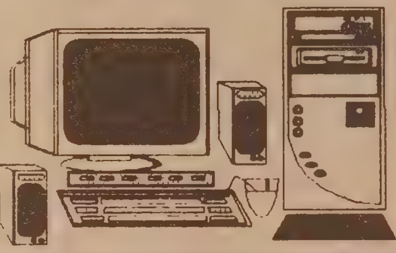

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Resources

Calendar Of Events *continued from page 197*

December

December 1 Director II: Custom Handlers. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

December 1 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

December 1–30 Kurzweil, Dragon and IBM Speech Recognition Training. San Mateo. Zephyr Training & Evaluation Company (ZTEC). Contact: (650)655-2405, or URL: *http://members.aol.com/zephyrbus/web/* .

December 1–4 AutoCAD R14 Fundamentals Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com* , or URL: *http://www.copperconn.com* .

December 1–5 Windows NT Optimization and Troubleshooting. Santa Clara. Learning Tree International. Contact: 1-800-THE-TREE, or URL: *http://www.learningtree.com* .

December 3 Careers in Multimedia. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

December 4–18 Intro to Digital Audio. San Francisco. Center for Electronic Art. Contact: (415)512-9300, *info@cea.edu* , or URL: *http://www.cea.edu/* .

December 8 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

December 8–12 Java: Discovering Its Power. Fremont. UC Berkeley Extension. Contact: (510)642-4111.

December 8–12 AutoCAD R14 Advanced 2-D Workshop. Santa Clara. The Copper Connection. Contact: (408)970-9838, *TeachACAD@aol.com* , or URL: *http://www.copperconn.com* .

December 8–12 Implementing Windows NT Security. Santa Clara. Learning Tree International. Contact: 1-800-THE-TREE, or URL: *http://www.learningtree.com* .

December 8–9 Developing Java Applets Using Visual Cafe Pro. Campbell. DeVries Data Systems, Inc. Contact: (408)866-8033.

December 9–12 Usenix Workshop on Internet Technology and Systems (WITS). Monterey, CA. USENIX Association. Contact: (714)588-8649, or URL: *http://www.usenix.org* .

December 10 Free Demonstrations: Kurzweil, Dragon and IBM Speech Recognition Training. San Mateo. Zephyr Training & Evaluation Company (ZTEC). Contact: (650)655-2405, or URL: *http://members.aol.com/zephyrbus/web/* .

December 13 Introduction to Painter. Berkeley. Kala Institute. Contact: (510)549-2977, or URL: *http://www.kala.org* .

December 15 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

December 15–19 Windows NT Optimization and Troubleshooting. Santa Clara. Learning Tree International. Contact: 1-800-THE-TREE, or URL: *http://www.learningtree.com* .

December 17 Free Demonstrations: Kurzweil, Dragon and IBM Speech Recognition Training. San Mateo. Zephyr Training & Evaluation Company (ZTEC). Contact: (650)655-2405, or URL: *http://members.aol.com/zephyrbus/web/* .

December 22 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

December 29 Free Microsoft Exchange Presentation. San Jose. Contact: (408)281-5818.

Software Vendors Vs. Software Pirates

continued from page 118

education. Some options include encryption technology, tougher laws and even greater enforcement.

From "Don't Copy That Floppy" To "Fink On Your Boss"

It's not just individuals who are involved in copying that floppy. Companies also illegally copy software. The SPA and a hospital in Michigan reached a settlement last year after it was discovered that the hospital was using unauthorized copies of software.

Last year, federal agents showed up at Waltham, MA-based CeraMem Corp., which makes ceramic membranes for filtering systems, with a court order to audit the company's computers. The agents found computer-aided design (CAD) programs, word processors and spreadsheets. The company agreed to a $48,000 settlement. Investigators were tipped off by a fired clerical worker.

The BSA launched an advertising campaign in the Midwest aimed at raising awareness among business travelers and urging them to report suspected cases of software piracy. The advertising premieres in Midwest airports this month and will continue through the Thanksgiving holiday travel rush.

After a highly successful run in New York City last year, the "Nail Your Boss" and "Blow the Whistle" advertising campaign is moving westward to Chicago, St. Louis, Cincinnati, Cleveland and Minneapolis/St. Paul, in an effort to educate business travelers. The campaign promotes BSA's toll-free hotline number for calls to report software piracy or obtain information on software management. The ads appear in all the metropolitan center airports across the Midwest and will be seen by more than 25 million travelers a month.

"The BSA is bringing the war against software piracy to the heartland," says Robert Holleyman, president of the Business Software Alliance. "Software enhances the efficiency and effectiveness of thousands of businesses and the lives and jobs of millions of consumers across the Midwest. With those benefits comes an obligation to respect the copyrights held by the developers of those products." ■

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RESOURCES:

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Software Publishers Association
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URL: *http://www.bsa.org/*
Software Protection
URL: *http://www.securityserver.com/category/@sftprt.htm*
Software Piracy: How Far Is Too Far?
URL: *http://www.acsu.buffalo.edu/~hlmeyer/Complaw/CompLawPapers/byrd.html*
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Microsoft's Licenses and Piracy
URL: *http://www.microsoft.com/piracy/*
E-mail Privacy
URL: *http://www2.ncsu.edu/eos/info/computer_ethics/www/piracy/index.html*

Intellectual Property In The Brave New Digital World

continued from page 130

imminent downfall of the cherished territory. This happened when the VCR came in and those in the television industry screamed about loss of their markets. None of that which provoked the screaming has ever been true. Those with vested interests learned how to adapt to the new medium and use it for their advantage. They did so or they perished."

Hoffman, one of several contributors to *cyberscribes.1: The New Journalists*, by Anne Hart (Ellipsys International Publications, 1997), left the entertainment law industry after a 22-year career in 1990 "to do other things." Seeing the monumental impact of the Internet on the entertainment industry, he restarted his practice in January 1996.

Hoffman says that copyright law is evolving along with the Internet. "What the Internet has provided is a means for the average person to compete in the publishing world—not just text, but graphics, photographs, music. Before the Internet, if you wanted to publish a book you needed a lot of money. You had to write the book, go to a printer, print the book, and get it into the distribution system. Now, all you really need is a mouse." He adds that the corollary is that you have to be concerned about protecting your rights to that material.

"Because it is so easy to take virtual property over the Internet, unlike in the hard-copy world, the single best way you can protect yourself—your rights—is by protecting other people's rights. If you run into a situation where you like what someone has written or some graphic you like, the best thing is to license it. Contact the people through email, tell them what you want, tell them what the kinds of rights you want. If you protect other people's rights, you are in fact protecting your rights," Hoffman says.

Each new advance in technology brings with it a need to balance the rights of the creator with the rights of the public, Hoffman says. Because the Internet makes it so easy to take other people's property, technology has to come along to figure out how to protect it.

Realistically, he says, as not everyone is going to take a philosophical high road in using an honor system to protect rights, there need to be "real world" technological tools. "Whether watermarking and encryption are going to be technologically sufficient remains to be seen." Hoffman cites new international copyright treaties proposed by the World Intellectual Property Organization, and other proposed domestic legislation such as the Infrastructure Copyright Protection Act proposed by Senate Judiciary Chairman Orrin Hatch (R-Utah) and Sen. Patrick Leahy (D-Vermont) to strengthen copyright protection in cyberspace, which, in part, would make it an infringement to eliminate protective devices such as digital watermarking. "For someone to develop a program that would defeat that watermark, under the language of the treaty, would probably be considered in and under itself an infringement," Hoffman says.

Copyright protection is something very important and must be preserved, he adds. "If I know I create something and if it is going to be made free for everybody to take without paying me, then I'm going to try to find another line of work. So when the US Constitution was drafted and the protection for artists and creators was included, it was with the intent to protect them while balancing other people's rights. Let's protect these creators so we can create all new means of expression.

"Copyright law is not absolute," he continues. "There are checks and balances in there, such as 'Fair Use,' for example, where people may use copyrighted material without payment to the copyright proprietor. I don't see the need to sweep away all laws to make ideas freely available. There will always be a tug between creators and users." ■

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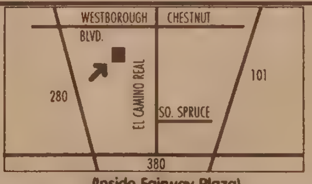

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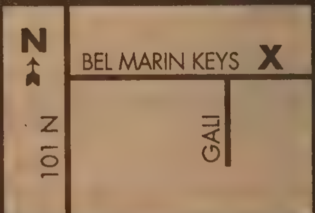

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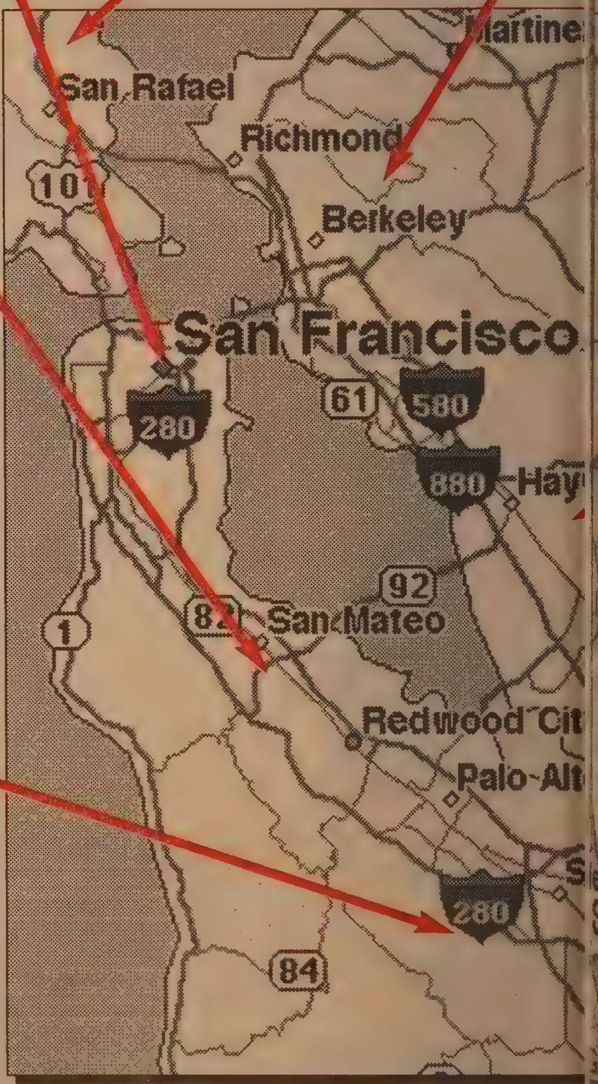

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- [illegible] jumpers and switches [illegible] Windows 95/NT [illegible] monitor made tested and continuously burned in for 48 hours on all components [illegible] for trouble-free operation. All systems are to be inspected by customer at pick up time.
- [illegible] configurations have been pre built, burn-in tested and are ready to be picked up or delivered within 60 [illegible] FREMONT MAIN OFFICE. Please allow more time for minor configuration changes. Standard delivery time is 72 hours.
- Free delivery area includes local area within 30 minutes driving distance. No delivery on weekends. Delivery out of local area will be charged up to $30 freight.
- Most components come with over 1 year manufacturer warranty - First year will be covered by UMiracle. Warranty after the first year will be covered by component manufacturers.
- While-you-wait immediate service should there be any necessary warranty repair. If we couldn't solve the problem, another system [illegible] discretion, if purchased within 30 days.)
- [illegible] repairs, exchanges, upgrades can be done in either Fremont, Belmont or Albany store. Original invoices & records

intel

Spade Chan
UMiracle Microsystems
44063 Fremont Blvd.
Fremont, CA 94538

UMiracle is the computer product provider we choose when we are looking for computer hardware or software for our company. As a validation engineer, we are continually seeking the latest technology as we enhance our testing environment. We have purchased most of our new hardware & software from UMiracle over the past few months, and these products have been very reliable We have also utilized UMiracle's technical engineering staff in the product choosing process which is very good in suggesting a variety of choices and cost effectiveness. We choose UMiracle for its helpful and responsive sales team, knowledgeable technical staff, and overall competitive pricing.

UMiracle is a computer product vendor that stands out, and fulfills our computing needs in a responsive manner. When it comes to technical difficulties, UMiracle stands behind their products and provides efficient and prompt support.

AMERICAN MEDICAL MANAGEMENT
2200 Powell St., Suite 455
Emeryville, CA 94530
(510) 450-1500
Fax (510) 446-7477

035 San Pablo Ave., Ste. 1
lbany, CA 94706

o whom it may concern:

We have been delighted to have UMiracle as our sole provider of comput ardware for our 7 server, 100+ user wide area network over the past y mely, reliable and extremely courteous. In addition to superlative service alespeople and knowledgeable and (most importantly) accessible support ave been extremely competitive.

During the past year our organization has grown from approximately 20 P pproximately 75 PCS with several laptops and 5 file servers distributed ov upplied virtually all of our hardware In the health care management indu f data is of the utmost importance and the hardware supplied by UMiracl eliability. In a few rare instances when there has been a problem with eit onfiguration, hardware was politely and promptly replaced and helpful tec vailable.

UMiracle succeeds in all three of the most import aspects of a computer h xcellent support and competitive pricing, and we will continue to rely upo

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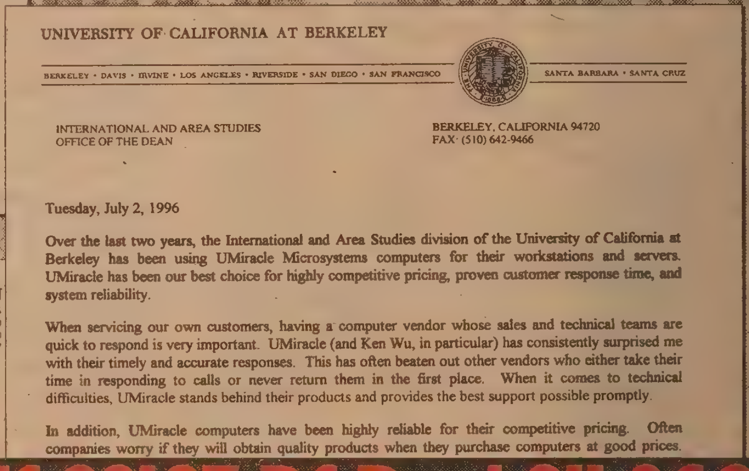

UNIVERSITY OF CALIFORNIA AT BERKELEY

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INTERNATIONAL AND AREA STUDIES
OFFICE OF THE DEAN

BERKELEY, CALIFORNIA 94720
FAX: (510) 642-9466

Tuesday, July 2, 1996

Over the last two years, the International and Area Studies division of the University of California at Berkeley has been using UMiracle Microsystems computers for their workstations and servers. UMiracle has been our best choice for highly competitive pricing, proven customer response time, and system reliability.

When servicing our own customers, having a computer vendor whose sales and technical teams are quick to respond is very important. UMiracle (and Ken Wu, in particular) has consistently surprised me with their timely and accurate responses. This has often beaten out other vendors who either take their time in responding to calls or never return them in the first place. When it comes to technical difficulties, UMiracle stands behind their products and provides the best support possible promptly.

In addition, UMiracle computers have been highly reliable for their competitive pricing. Often companies worry if they will obtain quality products when they purchase computers at good prices.

ASUS P2L97-DS Dual PII AGP

- ASUS P2L97-DS Intel Pentium II motherboard - 233-333Mhz Dual Pentium II support, 440LX AGPset with Accelerated Graphics Port Connector for optimal Video Graphics, onbrd Adaptec 7880 U-Wide SCSI ,5 PCI/2 ISA/1 AGP slots,DIMM, Onbrd I/O, UltraDMA PCI IDE, ATX format
- Genuine Intel Pentium® II Processor(s) w/Cooling Fan(s)
- 32MB 168Pin 10ns SDRAM DIMM
- 1.44MB Floppy Drive
- 3.2GB Quantum FireBall ST33260S Ultra-SCSI-2 HD
- Mitsumi FX162T 16X Speed Internal ATAPI IDE CD-ROM
- Sound Blaster Compatible ESS 16Bit PnP Stereo Sound Card
- ATi 3D ProTurbo PC2TV 4MB SGRAM Video Card
- 17" Hitachi CM-620 .28DP 1280x1024NI Monitor
- GigaStar ATX style Medium Tower 235W ATX PS
- KeyTronic 104 Key Win95 PS/2 Keyboard
- Logitech 3-Button MouseMan PS/2 Mouse w/ Pad
- Pair of 80Watt Stereo Speakers
- [illegible]

Call for AGP Video card UPGRADE!

Single Pentium II	
233MHz	$2333
266MHz	$2489
300MHz	$2870

Dual Pentium II	
233MHz	$2877
266MHz	$3189
300MHz	$3949

Options		
	MS DOS V6.22 + Windows V3.11	Add$10
	MS DOS V6.22 + Windows for WorkGroup V3.11	Add$36
	Windows NT 4.0 Workstation/Server	Add$155/$460

UMiracle

UMiracle Microsystems
44063 Fremont Blvd. Fremont CA 94538
Phone 510-226-[illegible] Fax 510-226-6758
Email: [illegible]umiracle.com
1035 San Pablo Ave#1, Albany CA 94706
[illegible]
[illegible]

DISCOVER
ATM
VISA
MasterCard

Albany Store

Ph:510-526-2626
1035 San Pablo Ave. #1
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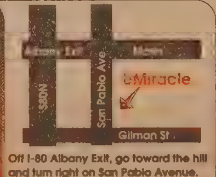
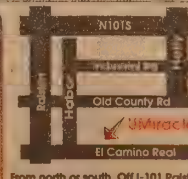


Off I-80 Albany Exit, go toward the hill and turn right on San Pablo Avenue. We are facing U.C. Village. Or off I-80 Gilman St, go toward the hill and make a left turn on San Pablo Ave.

Belmont Store

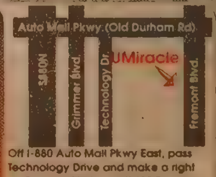
Ph:415-592-3333
1901 El Camino Real #E
[illegible]



From north or south, Off I-101 Ralston Ave, go towards west, left on El Camino Real and make a U-turn ASAP. We are on your right.

Fremont Main

Ph:510-226-3666
44063 Fremont Blvd
[illegible]



Off I-880 Auto Mall Pkwy East, pass Technology Drive and make a right on Fremont Blvd, (or off 680 Durham, go west, pass Osgood Rd, then make a left on Fremont Blvd.) first driveway on your right.

AND BE A WINNER!

Intel AL440LX Pentium II

- Intel AL440LX Pentium II Motherboard - 233Mhz & above CPU support, 440LX AGPset with Accelerated Graphics Port Connector for optimal Video Graphics, Yamaha OPL4 hardware wavetable audio,3 PCI 2 ISA/1 AGP slots, DIMM, Onbrd I/O, UltraDMA PCI IDE
- Genuine Intel Pentium® II Processor w/ Cooling Fan
- 32MB 168Pin 10ns SDRAM DIMM
- 1.44MB Floppy Drive
- 3.2GB Quantum FireBall ST33240A UltraDMA IDE HD
- Mitsumi FX162T 16X Speed Internal ATAPI IDE CD-ROM
- ATI 3D ProTurbo PC2TV 4MB SGRAM Video Card
- 17" Hitachi CM-620 .28DP 1280x1024NI Monitor
- GigaStar ATX style Medium Tower 235W ATX PS
- Liton SK6000 Ergonomic Win95 PS/2 Keyboard
- Logitech 3-Button MouseMan PS/2 Mouse w/ Pad
- Pair of 80Watt Stereo Speakers
- Legitimate MS Windows NT V4.0 Workstation CD + Manual + Installed + fully-configured

Intel Pentium® II

233MHz	$2197
266MHz	$2353
300MHz	$2738

Call for AGP Video card UPGRADE!

PII is here!

STRUCTURED CAPITAL MANAGE
A Division of First Southwest Company

Manager and
UMiracle Microsystems Inc
1501 El C
Belmont

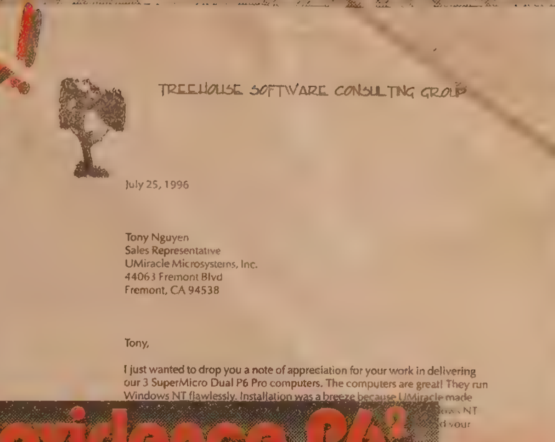
TREEHOUSE SOFTWARE CONSULTING GROUP

July 25, 1996

Tony Nguyen
Sales Representative
UMiracle Microsystems, Inc.
44063 Fremont Blvd
Fremont, CA 94538

Tony,

I just wanted to drop you a note of appreciation for your work in delivering our 3 SuperMicro Dual P6 Pro computers. The computers are great! They run Windows NT flawlessly. Installation was a breeze because UMiracle made



Intel DK440LX PII Dual

- Intel DK440LX Dual Pentium II Motherboard 82440LX AGPset - 233Mhz & above Dual CPU support, 440LX AGPset w/ Accelerated Graphics Port Connector for optimal Video Graphics,4 DIMM slots,Onbrd I/O,UltraDMA PCI IDE,onbrd Intel Pro10/100BT Ethernet/ Adaptec 7895 Dual Channel SCSI w/ RAIDport slot
- Intel Pentium® II 512K Processor(s) w/ Cooling Fan(s)
- 64MB 168Pin 10ns SDRAM DIMM
- 1.44MB Floppy Drive
- 3.2GB Quantum FireBall ST33260S Ultra-SCSI-2 HD
- Mitsumi FX162T 16X Speed Internal ATAPI IDE CD-ROM
- ATI 3D ProTurbo PC2TV 8MB SGRAM Video Card
- 19" Hitachi CM-751MU .22DP 1600x1200NI Monitor
- Premium ATX style Full Tower 235W ATX PS
- Liton SK6000 Ergonomic Win95 Keyboard
- Logitech 3-Button MouseMan Serial Mouse w/ Pad
- Pair of 120Watt Stereo Speakers
- Legitimate MS Windows NT V4.0 Workstation CD + Manual + Installed + fully-configured

Call for AGP Video card UPGRADE!

Single Pentium II

233MHz	$3313
266MHz	$3470
300MHz	$3854

Dual Pentium II

233MHz	$3862
266MHz	$4175
300MHz	$4944

Intel Providence P6²

- Intel Providence PR440FX Dual Pentium® Pro processor-based board - Intel 440FX PCISet, support Dual Pentium® Pro 200Mhz CPUs, EDO ECC 168Pin DIMM upto 512MB, Integrated LAN Controller Intel 82557 (=EtherExpress® Pro/100B), Integrated Ultra/Wide SCSI Adaptec® 7880 w/ onbrd+External mini-68Pin 16bit Wide Connectors, Integrated Audio - Crystal+Yamaha OPL3 FM Synthesizer 16bit Stereo Sound, 4 PCI+1 ISA slots, onbrd PCI Bus Master IDE Interfaces,HiSpd I/O, FD, Dual ZIF Socket 8, Flash AMI PnP BIOS, ATX form Factor
- Genuine Intel Pentium® Pro Processor(s) w/Cooling Fan(s)
- 64MB = 1 x 64MB 168Pin 8Mx72 EDO ECC Buffered DIMM
- 1.44MB Floppy Drive
- 3.2GB Quantum FireBall ST33260S Ultra-SCSI-2 HD
- Mitsumi FX162T 16X Speed Internal ATAPI IDE CD-ROM
- ATI 3D ProTurbo PC2TV 8MB SGRAM Video Card
- 21" Hitachi CM-800U .22DP 1600x1200NI 75Hz
- GigaStar ATX style Full Tower 235W ATX PS
- Liton SK6000 Ergonomic Win95 PS/2 Keyboard
- Logitech 3-Button MouseMan PS2 w/ Pad
- Pair of 120Watt Stereo Speakers
- Legitimate MS Windows NT V4.0 Workstation CD

	Single	Dual
180MHz 256k	$3178	$3395
200MHz 256k	$3469	$3976
200MHz 512k	$4018	$5074
200MHz 1mb	$Call	$Call

NotePack Options:	MS DOS V6.22 + Windows V3.11	Add$100
	MS DOS V6.22 + WFWG V3.11	[illegible]
	Windows 95 CD Full OEM Version	[illegible]
	Windows NT 4.0 Workstation/Server OEM	Add$145/$360

CHEM 9750 NoteBook Options

EDODIMM 16MB=8X2pc	$105
EDODIMM 32MB=16X2pc	$205
Auto Adaptor 12V	$75
AC Adaptor	$75
NiMH 2nd Battery	$105
Li-Ion 2nd Battery	$215
Battery Charger	$95
Port Duplicator	$130
Upgrade to 16x CDROM	$60

Harddrive/Accessories

1.4GB 2.5" IDE Slim HD	$215
2.1GB 2.5" IDE Slim HD	$325
3.0GB 19mm IDE Slim HD	$565
PCMCIA 33.6 Fax/Data	$129
PCMCIA Ethernet Comb	$85

MULTIMEDIA NOTEBOOKS

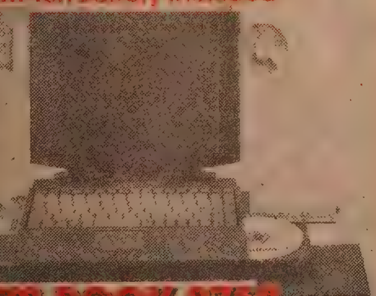
CHEMBOOK 9750 ■ P5 CPU upto 200MHz ■ Active Screen 12.1"/13.3" ■ 16MB EDO onbrd ■ 256K PB L2 Cache ■ 1.44FD ■ 10xSpeed CDROM ■ 2MB EDO Video RAM ■ Li-ion Battery ■ 16Bit Stereo Sound ■ Video Capture Port ■ 1S/1P ports ■ Infrared port ...

(1.4/2.1/3.0GB HD)	Active Matrix 12.1"	Active Matrix 13.3"
■ P5-133Mhz	$2222/$2318/$2530	$2816/$2911/$3124
■ P5-166Mhz	$2268/$2363/$2575	$2862/$2957/$2991
■ P5-200Mhz	$2340/$2436/$2648	$2934/$3030/$3242

Call for Intel Pentium 166/200MHz MMX Upgrade.

Large 13.3" Active Color
Video Capture Port Built-in
Lithium-Ion Battery Included

FD Replaceable w/2nd Battery
Upto 80MB Main Memory



CHEM BOOK 9750

CHEM 9750 SPECIFICATIONS

- Intel Pentium 120/133/150/166/200MHz/MMX
- 13.3" TFT XGA/12.1" TFT SVGA
- 16MB Memory onbrd, expand upto 80MB
- 800x600x16M True Colors, 2MB Video RAM
- 64bit PCI bus graphics accelerator
- SystemSoft Flash BIOS with PnP
- 10XI CD ROM, exchange w/FDD or Battery
- 16Bit Stereo Sound System
- Pipelined Synchronous 256K Level-2 Cache
- Infra-red IrDA and FIR
- Video Capture port
- Windows 95 Keyboard

CHEM 6800 SPECIFICATIONS

- Intel Pentium 100/120/133/166/200MHz
- Pipelined Synchronous 256K Level-2 Cache
- 12.1" Active Matrix Screen
- 2MB EDO Video RAM on PCI v2.1 Bus
- Expandable EDO Memory up to 64MB
- 800x600x16M True Colors
- 64Bit PCI bus with graphics accelerators
- SystemSoft flash BIOS with Plug & Play
- Built-in 11X CD-ROM
- 16Bit Stereo sound System
- 3 x Type II or 1 x Type II+1 x Type III (Support Zoom Video Port)
- Modem Ring in wake up on Power Mgmt
- Built-in 1MB Mask ROM hardware wavetable
- Removeable Floppy & hard drive
- Infra-red IrDA and FIR
- RCA jack for TV-Out
- Windows 95 Keyboard

FD Replaceable w/2nd Battery
Upto 64MB EDO memory
Large 12.1" Active Color
Built-in 11x CD-ROM
RCA Jack for TV Output
Lithium-Ion Battery Included

CHEM BOOK 6800

CHEMBOOK 6800 ■ P5 CPU ■ Active 12.1" ■ 16MB EDO 144DIMM ■ 256K L2 P.B. Cache ■ 1.44FD ■ 11X CDROM ■ 2MB EDO Video ■ TouchPad ■ 16Bit Stereo Sound ■ RCA Jack ■ 1S/1P ports ■ Li-ion Batt ■ Infrared port ...

Active Matrix 12.1" (1.4/2.1/3.0GB)	
■Pentium-133Mhz	$2222/$2318/$2530
■Pentium-166Mhz	$2268/$2363/$2575
■Pentium-200Mhz	$2340/$2436/$2648

CHEM 6800 NoteBook Options

16MB=16x1 144Pin EDO	$105
32MB=32x1 144Pin EDO	$195
Auto Adaptor 12V	$75
AC Adaptor	$80
Li-ion Internal Battery	$205
Battery Charger	$95

UMiracle
UMiracle Microsystems

- Free Local Area Delivery for System Purchase
- 1 Year Parts Warranty + Life Time Free Upgrade Labor on Systems
- Expertise Technical Support On Duty Daily
- 30 Day Compatibility Guarantee on Complete Systems

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What is RAID?

RAID is an acronym for Redundant Array of Inexpensive (or Independent) Disks. A RAID array is a collection of drives which collectively act as a single storage system, which can tolerate the failure of a drive without losing data, and which can operate independently of each other. Among all RAID implementations, RAIDport, the latest Adaptec RAID 5 solution, is the most cost-effective way to protect your data. If the data in your file server is vital to your survival of your business, RAID-5 is the way to go!

RAID-5 Pentium Pro^2 Server

- IWILL DP6NS Dual Pentium® Pro processor-based board w/Built-in Adaptec® PCI SCSI chipset 7880 (AHA-2940UW Ultra Wide SCSI), 50Pin Fast SCSI-2 & 68Pin Ultra Wide SCSI (40MB/s Burst) with optional RAID support, Intel 440FX chipset, ZIP Socket 8, 150-233Mhz, 3 PCI+4 ISA slots, FP or EDO 72Pin SIMM & support upto 512MB, built-in PCI-IDE interfaces, FD, 2-16550 UARTs, ECP/EPP, support 4 IDE HDs, PnP, 50pin SCSI + 68pin Wide SCSI + FD/HD/IO cables, PS/2 mouse port & EZ-SCSI V4.0L + complete Adaptec® software driver & manual included
- Aaaptec AAA-131 RAID 5 Ultra-Wide Adapter with 1MB Cache onbord
- Genuine Intel Pentium® Pro Processor(s) w/ Cooling Fan(s)
- 32MB=16MBx2 60ns 72Pin EDO SIMM RAM
- 1.44MB Floppy Drive
- Mitsumi FX162T 16X Speed Internal ATAPI IDE CD-ROM
- Four 3.2GB Quantum FireBall ST33240S Ultra-SCSI-2 HDs
- Trident 9680 PCI 1MB MPEG+AVI Video Card
- 14" ShamRock 1Kx768NI Pwr-Saving Monitor
- GigaStar ATX style Full Tower 235W ATX PS
- KeyTronic 104 Key Win95 PS/2 Keyboard
- MicroSoft Ergonomic Serial Mouse w/ Pad
- Legitimate MS Windows NT V4.0 5 user Server CD
  + Manual + installed + fully-configured

P6^2 is here!

	Single	Dual
180MHz 256k	$3283	$3499
200MHz 256k	$3573	$4079
200MHz 512k	$4132	$5197
200MHz 1mb	$Call	$Call

RAID-5 AMI Quad P6

- AMI (American Megatrends, Inc) Goliath Quad Pentium® Pro Processor EISA/PCI motherboard - U.S. designed & made 180/200MHz (or higher) 1/2/4 processors supported, easy processor upgrade thru CPU based board approach, 1GB memory max onboard with 168pin slots, 4 way Interleave structure for max performance ECC supported, 168Pin DIMM supported, Intel 82450GX chipset, AMI Green Flash BIOS, 6 PCI + 4 EISA slots, integrated I/O w/ 1P/2S/FD/ IDEs/PS2 mouse
- Genuine Intel Pentium® Pro Processor(s) w/ Cooling Fan(s)
- 64MB=32MBx2 168Pin 4Mx72 EDO ECC Buffered DIMM
- 1.44MB Floppy Drive
- Mitsumi FX162T 16X Speed Internal ATAPI IDE CD-ROM
- DPT SmartRAID IV RAID-5 Ultra-Wide SCSI-3 PCI 2 channels with 8MB parity cache memory for speedy performance
- Five 3.2GB Quantum FireBall ST33260S Ultra-SCSI-2 HDs
- Trident 9680 PCI 1MB MPEG+AVI Video Card
- 14" ShamRock 1Kx768NI Pwr-Saving Monitor
- Heavy-Duty Server Case Model LT-18 supporting 11 drive bays, 26"x10"x25", removable front & side doors, Lockable front door for security, "snap-in" drive mounts, swing-out feet
- 400W AT Size Power Supply special-designed for AMI Goliath with 12V/5V/3.3V DC output
- KeyTronic 104 Key Win95 PS/2 Keyboard
- MicroSoft Ergonomic Serial Mouse w/ Pad
- Legitimate MS Windows NT V4.0 5-user Server CD
  + Manual + installed + fully-configured

P6^4 is here!

ULTRA WIDE

40MB/S Ready!!!

Intel Pentium® Pro

Dual 200MHz 256/512k
$9339/$10498

Quad 200MHz 256/512k
$11546/$13863

LOOKING FOR YOUR DREAM MACHINE AT THE CHEAPEST PRICE? SHOPPING FOR A PC IN THIS RAZOR-THIN-PROFIT INDUSTRY IS DANGEROUS BECAUSE 70% OF THE DEALERS WON'T LIVE TILL THE FOURTH YEAR IN BUSINESS, MOST SELL 3 OR 4 MACHINES A WEEK WITHOUT KNOWING WHAT THEY ARE SELLING AND 99% DON'T WANT TO SEE ANY MACHINE COMING BACK AFTER YOU WALK OUT OF THE DOOR. AT UMIRACLE, WE BUILD HUNDREDS OF PC'S EVERY WEEK, WE TEST EVERY POSSIBLE COMBINATIONS OF SOFTWARE AND HARDWARE FOR COMPATIBILITY, AND WE STAND BEHIND YOUR PC'S LIFETIME LONG! WHY? BECAUSE WE LOVE YOUR PC AS MUCH AS YOU DO! COME BY AND VISIT ONE OF OUR STORES AND YOU WILL FIND OUT WHY YOU WILL BE THE WINNER!

Thunder 2 Dual PII

- TYAN Thunder-2 ATX S1696DLUA Dual Pentium II 233-300 MHz System Board - 1 AGP+5 PCI+2 ISA Slots, 4 168Pin DIMM for Max 1GB, Onbrd Adaptec dual channel U-Wide SCSI with RAIDport option, Yamaha PCI Wavetavie sound, Super IO/FD/IDEs/USBs/PS2, Flash AMI BIOS
- Intel Pentium® II CPU(s) w/ Cooling Fan(s)
- 64MB 168Pin 10ns SDRAM DIMM
- 1.44MB Floppy Drive
- Three 3.2GB Quantum FireBall ST33260S Ultra-SCSI-2 HDs
- Mitsumi FX162T 16X Speed Internal ATAPI IDE CD-ROM
- Trident 9680 PCI 1MB MPEG+AVI Video Card
- 14" ShamRock 1Kx768NI Pwr-Saving Monitor
- GigaStar ATX style Medium Tower 235W ATX PS
- KeyTronic 104 Key Win95 PS/2 Keyboard
- MicroSoft Ergonomic Serial Mouse w/ Pad
- Legitmate MS Windows NT V4.0 5-user Server CD
  + Manual + installed + fully configured

Call for AGP Video card UPGRADE!

Single Pentium II

233MHz $3133
266MHz $3294
300MHz $3679

Dual Pentium II

233MHz $3677
266MHz $3997
300MHz $4769

NT ENHANCEMENTS

NT Guaranteed! All hardware listed below are guaranteed to be NT V4.0 compatible. We will make it right or your money back!

■ **Memory**
- *16/32/64/128MB 10ns SDRAM UnBuffered 168Pin DIMM for 430VX/TX .... $Call*
- *16/32/64/128MB 60ns DRAM ECC EDO Buffered 168Pin DIMM for 440FX .... $Call*

■ **RAID 5 Fast Ultra Wide SCSI-2 Host Adapter**
(for RAID-5 implementation, an IDE HD as boot drive is recommended)
- *DPT SmartCache IV SCSI Adapter & RAID Series/SmartRAID IV RAID Series .... $Call*
- *Mylex DAC960 Series Hi-Performance PCI RAID Controller with upto 3 UW SCSI channels supporting 45 HDs, upto 64MB Cache Installable .... $Call*
- *AMI Complete MegaRAID Solution including:SCSI RAID level 0,1,3,5,10,30, and 50 PCI Disk Array Controllers/FlexRAID/Advanced Management Software/Advanced Enclosure Management/Boot-Up Configuration/Power Console/General Alert .... $Call*

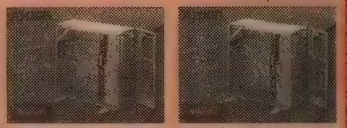
■ **TapeDrive - HP DAT DDS/DDS-2 Drive (Sold & integrated with system only)**
- *HP DAT C1534 DDS DAT Tape Drive (2GB on 90m Tape) $540*
- *HP DAT C1536 DDS DAT Tape Drive w/DCLZ Hardware Compression (4GB on 90m Tape with compression) $605*
- *HP DAT C1599A DDS-2 DAT Tape Drive w/DCLZ Hardware Compression (8GB on DDS-2 format with compression) $779*
- *HP DAT C1553A DDS-2 Autoloader w/DCLZ Hardware Compression (48GB on DDS-2 format with compression) $2010*
- *Seagate 32GB DAT DDS-2 Autoloader 4586NP (4 DAT Tape Support) $1235*
- *Optional 12 Tape Magazine for above 4586NP upto 96GB (no tape) $135*

■ **High End Video Card - 3D Rendering/Graphic Animation/OpenGL**
- *Symmetric GLyder MAX/TX-16/TX-40/MP-40 3D Accelerator .... $520/$1790/$2245/$2520*
- *Dynamic Pictures OpenGL Accelerator Oxygen102/202/402 .... $985/$2075/$3655*

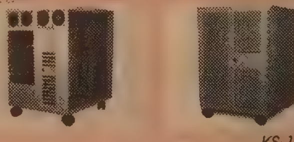
■ **Server Chassis (T-101)/Disk Array Chassis (T-103): Dimension=13"x31"x22" w/Dual Redundancy & Hot Swappable Power Supplies .... $880/$880**
- *T-101: 12 DriveBays/Upto 2 PowerSupply 2x300W*
  2x4.6" Smart Fans w/ Efficient Air Flow
  Full Size AT Motherboard FormFactor
- *T-103: 16 DriveBays/Upto 2 PowerSupply 2x300W*
  2x4.6" Smart Fans w/ Efficient Air Flow
  Perfect RAID Disk-Array Sub-Chassis

■ **Server Chassis LT-18 By Axxion w/o Power Supply.....$480**
- *Full-size AT, Baby AT, oversize AT based boards, 11 drive bays (one 3.5" and four 5.25" exposed, six 5.25" hidden bays), Twelve slots, "snap-in" drive rails, secondary cooling fans, accepts standard power supply.*
  Dimensions: 26" x 10" x 24.5" (DxWxH),

LT-18 by Axxion



■ **Server Enclosure KS-1400 w/ Dual Redundant Hot-Swappable 300Wx2 PS.....$990**
- *Full-size AT, Baby AT, oversize AT based boards, 14 5.25" drive bays, Twelve slots, "snap-in" drive rails, 8 cooling fans,*
  Dimensions: 20.5" x 16.25" x 23.75" (DxWxH)



KS-1400

■ **CD-ROM Tower Subsystem Chassis**
- *7 Plextor 20X PX-20TSI w/250W PS $2039*
- *7 Toshiba 15X XM-3801B w/250W PS $1255*
- *7 Toshiba 12X XM-5701B w/250W PS $1085*

■ **UPS Un-interrupted Power Supply**
- *APC SmartUPS 420VS 420VA 4 minute Full 9 Minute Half load 4 outlets $269*
- *APC SmartUPS 650VS 650VA 5 minute Full 11 Minute Half load 4 outlets $325*
- *APC SmartUPS 1000VS 1000VA 6 minute Full 15 Minute Half load 6 outlets $455*
- *APC SmartUPS 1400VS 1400VA 7 minute Full 19 Minute Half load 6 outlets $599*

Compatibility Guaranteed

Call for your preferred hardware not listed above

Windows NT 4.0 Server/Workstation

UMiracle

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Email: sales@albany.umiracle.com
1501#E El Camino Rl. Belmont CA 94002
Phone 650-592-3333 Fax 650-592-2919
Email: sales@belmont.umiracle.com

DISCOVER
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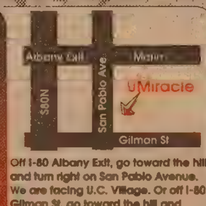
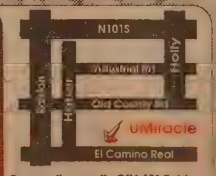
MasterCard

Albany Store
Ph:510-526-2626
1035 San Pablo Ave #1
[illegible]



Off I-80 Albany Exit, go toward the hill and turn right on San Pablo Avenue. We are facing U.C. Village. Or off I-80 Gilman St, go toward the hill and make a left turn on San Pablo Ave.

Belmont Store
Ph:415-592-3333
1501 El Camino Real #E
Belmont CA 94002
[illegible]
Sunday 10:30AM-6:00PM
Yes! Open on Sunday



From north or south, Off I-101 Ralston Ave, go towards west, left on El Camino Real and make a U-turn ASAP. We are on your right.

Fremont Main
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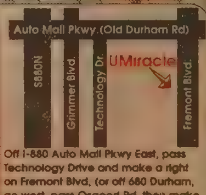
43063 Fremont Blvd.
Fremont CA 94538
[illegible]



Off I-880 Auto Mall Pkwy East, pass Technology Drive and make a right on Fremont Blvd, (or off 680 Durham, go west, pass Osgood Rd, then make a left on Fremont Blvd.) first driveway on your right.

REAL STUFF, REAL QUALITY, REAL PRICES

Motherboard without CPU: (Call for [illegible])

A-BIT Office Pro PX-5 Jumperless 512K TX-chipset Motherboard Pentium 75-200Mhz/Cyrix® 686-200+/AMD K5/K6 DIMM+SIMM supported, 4 PCI+4 ISA slots, onbrd PCI-IDE, HISpd I/O, FD, Flash BIOS w/ OverClock Setting AT Form	$105
A-BIT Office Pro AX-5, same as above but in ATX Form	$115
ASUS TX97 Pentium® processor-based board - 430TX PCISet, Pipelined 512K onbrd, 75-200Mhz Pentium/MMX/AMD/Cyrix200+ CPUs, 4 PCI+4 ISA+1 ASUS MediaBus slots, 168Pin DIMMx3 support, onbrd Ultra-IDE, FD, HISpd I/O, Flash Award BIOS w/NCR SCSI Suppt, AT form factor	$150
ASUS TX97-E same as TX97, plus 72PinSIMMx4 support	$155
ASUS TX97-X Pentium® processor-based board - 430TX PCISet, Pipelined 512K onbrd, 75-200Mhz Pentium/MMX/AMD/Cyrix200+ CPUs, 4 PCI+4 ISA slots, 168Pin DIMMx3 support, CreativeLabs VIBRA PnP Audio, onbrd Ultra-IDE, FD, HISpd I/O, USB, Flash Award BIOS w/NCR SCSI Suppt, ATX form factor	$187
ASUS TX97-XE same as TX97X, plus 72PinSIMMx4 support	$189
ASUS P2L97 Intel Pentium II motherboard - 233-333Mhz support, 440LX AGPset with Accelerated Graphics Port Connector for optimal Video Graphics, 5 PCI/2 ISA/1 AGP slots,DIMM, Onbrd I/O, UltraDMA PCI IDE, ATX format	$255
ASUS P2L97-S same as P2L97, plus onbrd Adaptec 7880 U-Wide SCSI	$359
ASUS P2L97-DS same as P2L97, plus onbrd Adaptec 7880 U-Wide SCSI and Dual Pentium II CPU support	$425
Intel Anchorge AN430TX Pentium MMX motherboard - Yamaha OPL4 hardware wavetable audio, 512K Cache, 430TX chpst, 3 ISA+3 PCI slots, onbrd PCI-IDE, FD, I/O, PS/2 connectors, Flash AMI BIOS, 168Pin DIMM support upto 256MB, ATX form factor	$179
Intel Portland PD440FX Pentium II ATX Motherboard - Boxed version, 233-266MHz Supported, 440FX Chipset, 3 ISA+3 PCI Slots, 512K Cache on Pentium II CPU Cartridge, 4 72Pin SIMM Slots, Onboard Super I/O/FD/IDEs/ PnP Yamaha POL3 Integrated Audio	$250
Intel AL440LX Pentium II Motherboard - 233Mhz & above CPU support, 440LX AGPset with Accelerated Graphics Port Connector for optimal Video Graphics, Yamaha OPL4 hardware wavetable audio,3 PCI/2 ISA/1 AGP slots, DIMM, Onbrd I/O, UltraDMA PCI IDE, ATX format	$289
Intel DK440LX Dual Pentium II Motherboard 82440LX AGPset - 233Mhz & above Dual CPU support, 440LX AGPset w/ Accelerated Graphics Port Conntr for optimal Video Graphics,4 DIMM slots,Onbrd I/O,UltraDMA PCI IDE,onbrd Intel Pro10/100BT Ethernet/Adaptec 7895 Dual Channel SCSI w/ RAIDport slot	$Call
•Intel Providence PR440FX Dual Pentium® Pro processor-based board - Intel 440FX PCISet, support Dual Pentium® Pro CPUs w/VRM, ECC EDO buffered 168Pin DIMM upto 512MB, Integrated LAN Controller Intel 82557 (=EtherExpress® Pro/100B), Integrated UltraWide SCSI Adaptec® 7880 w/onbrd + External mini-68Pin Wide Connector, Integrated Audio - Crystal+Yamaha OPL3 FM Synthesizer 16bit StereoSound, 4 PCI+1 ISA slots, onbrd PCI Bus Master IDE ports,HISpd I/O, FD, Dual ZIF Socket 8, Flash AMI PnP BIOS	$425
IWILL P55XUW PCI Pentium® processor-based ATX board w/ Built-In Adaptec® PCI SCSI chipset 7880 (AHA-2940UW UltraWide SCSI), Intel 430TX chpst, MMX/ Cyrix 686 CPU support, 50Pin Fast SCSI-2 & 68Pin Ultra Wide SCSI (40MB/s Burst) with optional RAID support, Pipelined 512K Cache onbrd, 3 PCI+4 ISA slots, 72Pin SIMM & 168PIN DIMM, onbrd UltraDMA IDE ports, FD, HISpd I/O, USB, 50+68Pin Wide SCSI + FD/HD/IO cables, Musical alarm CPU fan, PS/2 mouse port & EZ-SCSI V4.0L + Adaptec® software & manual included	$295
IWILL DP6NS Dual Pentium® Pro processor-based board w/Built-In Adaptec® PCI SCSI chipset 7880 (AHA-2940UW UltraWide SCSI), 50Pin Fast SCSI-2 & 68Pin Ultra Wide SCSI (40MB/s Burst) with optional RAID support, Intel 440FX chpst, 150-233Mhz, 3 PCI+4 ISA slots, 72Pin SIMM support upto 512MB, onbrd PCI-IDE ports, FD, HISpd I/O, 50Pin SCSI + 68Pin Wide SCSI + FD/HD/IO cables, PS/2 mouse port & EZ-SCSI V4.0L+Adaptec® software driver & manual	$505
IWILL PIINS Pentium II processor-based board - 233-300MHz Supported, 440FX Chipset, 4 ISA+4 PCI Slots, 512K Cache on Pentium II CPU Cartridge, 8 SIMM Slots upto 1GB, Onboard Super I/O/FD/IDEs/USBs, Built-In Adaptec® PCI SCSI chipset 7880 (AHA-2940UW UltraWide SCSI), 50Pin Fast SCSI-2 & 68Pin Ultra Wide SCSI (40MB/s Burst) with optional RAID support, ATX, Award BIOS	$405
TYAN Tahoe-A ATX S1684SA Pentium II 233-300 MHz System Board - 4 PCI + 4 ISA Slots, 6 72Pin SIMM for Max 512MB, Integrated Creative Labs Vibra 16 Audio, Onbrd Super IO/FD/IDEs/USBs/PS2, Flash Award BIOS (Also supports Pentium Pro CPU with optional Riser Card)	$245
TYAN Tahoe-2 ATX S1682D Dual Pentium II 233-300 MHz System Board - 5 PCI + 3 ISA Slots, 8 72Pin SIMM for Max 512MB, Onbrd Super IO/FD/IDEs/USBs/PS2, Flash Award BIOS (Also supports Pentium Pro CPU with optional Riser Card)	$300
Tyan Tiger 2 ATX (S1692DL) - Pentium II board w/ Intel 440LX chipset	$Call
Tyan Thunder 2 ATX (S1696DLUA) - Dual Pentium II board w/ 440LX chpst	$Call
AMI (American Megatrends, Inc) Goliath Quad Pentium® Pro Processor EISA/ PCI motherboard - U.S. designed and made 180/200MHz (or higher) 1/2/4 processors supported, easy upgrade thru CPU based board approach, 1GB memory max onboard with 168 pin slots, 4 way Interleave for max performance, ECC support, 168Pin DIMM support, 82450GX chpst, AMI Flash BIOS, 6 PCI+4 EISA slots, Integrated I/O w/ 1P/2S/FD/IDE, Full Size AT form factor	
Above w/ two 200MHz Pentium Pro 256K CPUs	$5220
Above w/ four 200MHz Pentium Pro 256K CPUs & 2nd CPU baseboard	$7835

CPU & Memory (Prices Subject to Change without notice)

Intel Pentium® Pro processor 256K/512K/1024K 150/180/200Mhz	$Call
Intel Pentium® II processor 233MHz/266MHz/300MHz 512K Cache	$Call
Pentium® P5-100/120/133/150/166/200/233MHz/MMX CPU	$Call
AMD K5/K6/Cyrix®/IBM® 6x86-166+/200+/M2 CPU	$Call
256/512K Synchronous Pipelined Cache COAST module	$20/$25
72Pin SIMM - 32/36Bit-FP/EDO/Parity	$Call
16/32/64MB 168Pin SDRAM DIMM Unbuffered 12ns for Triton VX/TX board	$Call
32/64/128MB 168Pin EDO DRAM DIMM w/ECC Buffered 60ns	$Call

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Adaptec 2940U Ultra SCSI-2/2940UW SCSI-2 Controller	$180/$205
Adaptec AAA-131/AAA-133 RAID 5 Ultra-Wide SCSI-2 Multi-Channel Host Adaptor w/1MB Cache onbrd	$460/$795
Western Digital PCI-SCSI Adapter - 7193RTL, Fast SCSI-2, 10MB/s, CorelSCSI!	$85
External SCSI-2 50Pin Mini-68Pin Adapter for Internal 50pin ribbon cable SCSI	$20
External Wide SCSI Mini-68Pin Adapter with 3-68pin-connector internal ribbon cable for any onboard internal 68pin Wide SCSI interface	$45
Fast Wide SCSI-2 Internal Ribbon Cable, 68Pin, 2/3 connectors	$20/30
External SCSI Cables/Terminator Centronic/Mini/UltraDensity 50/68Pin	$Call

Network Card

Ethernet NE2000 ISA PnP/Softset 16Bit Combo/PCI Combo	$25/$45
Intel EtherExpress Pro 10/100 PCI ENET 32Bit 10-BT (PILA8465B)	$65
3COM Etherlink III 3C509B Combo	$70
3COM Etherlink XL 3C900 Parallel-Tasking PCI Combo	$78
3COM Fast Etherlink XL 3C905-TX Parallel-Tasking 100BT PCI	$65

Video Card

Trident 9680 Windows Accelerator PCI 1MB/2MB with MPEG and AVI Motion Video built-in	$35/45
Diamond Stealth 3D 2000XL PCI 4MB EDO-DRAM	$80
Diamond Stealth 3D 3000XL PCI 2MB/4MB VRAM	$110/$150
ATI 3D ProTurbo PC2TV SGRAM 4MB/8MB	$135/$180
ATI All-In-Wonder 7-In-One TV, Video and Graphic multimedia,PC or TV Display, TV Tuner, w/ ATI's 3D RAGE II and ImpactTV chipset 4MB	$265
ATI Xpert@Work/Xpert@Play AGP Video card	$Call
Matrox MGA Millennium II WRAM PCI 4MB/8MB	$215/$365
Memory module for Millennium II 4MB/8MB/12MB	$145/$235/$325
Matrox MGA Mystique 220 2MB/4MB SGRAM OEM	$89/119
Matrox MGA Millennium 3D WRAM AGP Video card	$Call
Diamond VIPER V330 AGP(Accelerated Graphic Port) 4MB SGRAM 2D/3D NVIDIA RIVA128 Chpst 128Bit Windows Accelerator Upgradabel to DVD	$195
Diamond FIRE GL1000 Pro 4MB/8MB AGP, SGRAM 2/3DLabs Permedia 2 Graphics Chipset	$215/$285

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14" ShamRock 1Kx768NIx0.28DP Digital Control Pwr-Saving Monitor	$160
15"/17" ShamRock 1280x1KNIx0.28DP Monitor	$230/$445
Hitachi NSA SuperScan Pro CM-500U 15" .28DP, 1280x1024	$315
Hitachi NSA SuperScan Pro CM-620U 17" .28DP, 1280x1024	$525
Hitachi NSA SuperScan Pro CM-751MU 19" .22DP, 1600x1200	$1045
Hitachi NSA SuperScan Pro CM-800U 21" .22DP, 1600x1200x75Hz	[illegible]
Hitachi NSA SuperScan Elite CM-630U 17" .22DP, 1600x1280x69Hz	$695
Hitachi NSA SuperScan Elite CM-802U 21" .22DP, 1600x1280	$1790
Hitachi NSA SuperScan Elite CM-803U 21" .22DP, 1800x1440 77Hz	$1890
IIYAMA VisionMaster-17 MF-8617E 17" .26DP, Microprocessor Contrl, PnP, DPMS, MPRII, Full On-screen program, 1600x1200@69Hz	$540
IIYAMA VisionMaster-Pro 17 MT-9017E 17" .25DP, Microprocessor Contrl, PnP, DPMS, MPRII, Full On-screen program, 1600x1200@72Hz, Trinitron Tube	$620
IIYAMA VisionMaster MF-8221E 21" .22x.16DP, Microprocessor Contrl, PnP, DPMS, MPRII, Full On-screen program, 1600x1200@76Hz	$1255
IIYAMA VisionMaster MT-9021E 21" .30x.00DP, Microprocessor Contrl, PnP, DPMS, MPRII, Full On-screen program, 1600x1200@76Hz, Trinitron Tube	$1325
Sony 15" 100SX/100SF 17" 200SX/200SF/17SE2T	$339?$375/$595/$665/$850
Sony 20" 300SFT/GDM20SE2T	$1395/$1745
Viewsonic E641/E655/15GA/15GS/17EA/17GA/17PS/PT770/PT775/GT770/G800/ G810/PT813/G810/GT800/29GA/P810/P815/etc	$Call
Mitsubishi, NEC, ADI, Nokia	$Call

Modem

SupraExpress 33.6K Voice Fax Internal PnP	$65
SupraExpress 56K Internal PnP Fax only / Fax + SpeakerPhone	$125/$145
USR Sportster 33.6K Faxmodem Internal/External	$95/$145
USR Sportster 33.6K Voice Faxmodem w/Voice Internal	$105
USR Sportster x2-56K Faxmodem Internal/External	$150/$195
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Floppy Drive/Tape Backup

Floppy Drive 1.44M 3.5"/Teac 1.2M 5.25"/1.44M 3.5"	$24/$45/27
Colorado 3.2GB T-3000 off floppy Travan w/Win95 Sftwre, w/tape	$179
Colorado HP T4000S 8GB, 62MB/min, SCSI-2, Travan TR-4, internal, w/tape	$359
Seagate 4586NP SCSI-2 DAT DDS-2 Autoloader supports 4 - 120m 4MM DAT tapes for 32GB, optional 12 tape magazine for 96GB	$1235
Optional 12 tape magazine for above	$135
a:Drive LS-120MB Super Floppy Drive 5X1.44FD speed, read/write 1.44MB	$Call
Iomega ZIP Drive 100MB w/disk ATAPI IDE -Internal	$120
Iomega ZIP Drive 100MB w/disk SCSI-Internal/External	$140/$155
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Iomega Jaz Drive 1GB w/disk SCSI-Internal/External	$295/$400
Iomega Jaz Drive Disks single/five pack	$92/$445
Iomega Ditto TapeBackup 2GB Insider Tavan TR-1,2,3	$130
Iomega Ditto TapeBackup 3200 Insider 3.2GB Tavan QIC w/o tape	$165
Tape Cartridge TR-1/TR-3/TR-4/DAT	$32/$35/$45/$Call

KeyBoard/Mice/Software/Chassis/PowerSupply/Misc:

Mitsumi/KeyTronic 104 Enhanced Win95 Keyboard	$12/$21
Focus 2001 104 Win95 Key Enhanced Click w/Cover	$33
Focus 6002 104 Win95 Key Enhanced w/ wristrest	$30
Natural Keyboard SK-6000 Win95 Key Enhanced / with Touch Pad	$50/$70
MicroSoft Natural Keyboard Win95 Key/Ergonomic Serial/PS 2 type	$70/$30/$35
Logitech 2-Button Mouse Serial/PS2	$12/$12
Logitech Mouseman Serial+PS 2 Combo/Cordless	$30/$85
Logitech Trackman Marble	$80
MS DOS 6.22/Windows V3.11/WFWG V3.11(w/System Purchase)	$45/55/75
MS Windows 95 Full CD OEM/NT V4.0 Workstation (w/SystemPurchase)	$90/$145
MS Office Professional 97 CD version	$325
MS Windows NT V4.0 Server with 5 User Access License OEM	$550
MS Windows NT V4.0 Server 20 User Access License (No Software)	$580
GigiStar Series Full Tower AT 250W/ATX 230W	$110/$115
GigiStar Series Medium Tower AT 250W/ATX 230W	$85/$90
GigiStar Series Mini Tower/DeskTop AT 230W	$50/$55
Server Class Super Case w/250W PS w/ detachable front panel, Dual side door, solid construction, slide-in Drive Bay, Dual fans, lots of bays, Fits Full/Baby AT Size board, Medium/Full Tower	$115/$140
Server Chassis (T-101)/Disk Array Chassis (T-103): Dimension=13"x31"x22" w/Dual Redundancy & Hot Swappable Power Supplies:	
- T-101:12 DriveBays/Upto 2 PowerSupply 2x300W, 2x4.6" Smart Fans w/ Efficient, Air Flow, Full Size AT Motherboard FormFactor	$880
- T-103: 16 DriveBays/Upto 2 PowerSupply 2x300W, 2x4.6" Smart Fans w/ Efficient Air Flow, Perfect RAID Disk-Array Sub-Chassis	$880
Server Chassis LT-18 By Axxion w/o Power Supply - Full-size AT, Baby AT, oversize AT based boards, 11 drive bays (one 3.5" and four 5.25" exposed, six 5.25" hidden bays), Twelve slots, "snap-in" drive rails, second cooling fans, accepts standard power supply, Dims: 26" x 10" x 24.5"	$480
Server Enclosure KS-1400 w/ Dual Redundant-Hot-Swappable 300Wx2 PS, Full-size AT, Baby AT, oversize AT based boards,14-5.25" drive bays, Twelve slots, "snap-in" drive rails, 8 cooling fans, Dims: 20.5" x 16.25" x 23.75" (DxWxH)	$990
Deluxe External SCSI Case w/Terminator+SCSI Cable+P/S+Fan 3.5" Half Height/5.25" Half Height	$60/$90
Deluxe External SCSI Case w/68Pin Wide/Ultra Wide SCSI Connector + P/S + Fan 3.5" Half Height with 68Pin External Cable and Terminator	$150
Power Supply PS-2 Type 230W/250W/300W	$28/$35/$85
Power Supply ATX Type 235W/300W	$55/$85
486/P5/P6 CPU Cooling Ball-Bearing Fan w/heat sink	$6/$12/$25
Chassis Second Cooling Fan 3" or 3.5"	$15
Printer Cable 6'/10'/15'/25'	$5/7/[illegible]
PS/2 mouse port connector for motherboard PS/2 mouse port	[illegible]

CD-ROM Drive

Toshiba XM-6102B 24X Speed Internal ATAPI IDE CD ROM	$95
Panasonic CR585 24X Speed Internal ATAPI IDE CD-ROM	$95
Mitsumi FX162T 16X Speed Internal ATAPI IDE CD-ROM	$85
Mitsumi FX810T 8X Speed Internal ATAPI IDE CD-ROM	$65
Toshiba XM-5701 12X Speed Internal SCSI CD ROM	$115
Toshiba XM-3801B 15X Speed Internal SCSI CD ROM	$145
Plextor 20-Plex 12/20XSpeed, 1800-3000Kb/sec, Fast SCSI2, 95ms seek, 512K Buffer, SCAM, w/Tray, PX-20TSI Internal	$240
Philips CDD2600 SCSI-2 CD-ROM Writer 1MB Cache,2X record & up to 6X read, w/SCSI Controller, Corel CD Creator, 2 blank CDs Internal/External	$490/$595
Yamaha CD-ROM Writer CDR400TIPC/CDR401TIPC 512KB Cache, up to 4X record & 6X read, Internal bare version w/Software SCSI2/IDE	$750/$760
Ricoh CD-ReWritable and Recordable Drive SCSI-2 2xWrite/6xRead, Internal,w/ Adaptec Controller, Direct CD UDF packet writing software + Seagate Backup Exec and Easy CD Pro Suite for 95	[illegible]

[illegible]

Yamaha, Altec, Lansing Speakers	$Call
60W/80W/120W Hi-Fi Amplified Stereo Speakers	$15/30/55
Sound Blaster Compatible 16Bit ESS Stereo w/PnP, IDE port	[illegible]
Sound Blaster 16 PnP OEM	[illegible]
Sound Blaster AWE64 PnP Value OEM	[illegible]
Sound Blaster AWE64 GOLD PnP w/ IDE Interface Retail	[illegible]
Digital Video Conference Kit - 24bit color camera, PCL Capture Card, 100% Vision Compatible. Complete Software + driver for Win95	[illegible]
Audio Cable - CD-ROM to Sound Card	$3

[illegible]

Western Digital - Caviar

1.2GB IDE WDAC11200 - Enhanced IDE Mode-4 256KB 11ms 5200RPM	[illegible]
2.0GB IDE WDAC22000 - Enhanced IDE Mode-4 256KB 11ms 5200RPM	$185
2.5GB IDE WDAC22500 - Enhanced IDE Mode-4 256KB 11ms 5200RPM	$205
3.1GB IDE WDAC33100 - Enhanced IDE Mode-4 128KB <12ms 5200RPM	$215
4.3GB IDE WDAC34300 - UltraDMA 33.3Mb/s 256KB 11ms 5400RPM	[illegible]
5.1GB IDE WDAC35100 - UltraDMA 33.3Mb/s 256KB 11ms 5400RPM	$Call
6.4GB IDE WDAC36400 - UltraDMA 33.3Mb/s 256KB 9.5ms 5400RPM	$Call
2.1GB Ultra SCSI-2 Enterprise E2170-3 512KB 7200RPM	$470
2.1GB UltraWide SCSI-2 Enterprise E2170-7 512KB 7200RPM	$475
4.3GB Ultra SCSI-2 Enterprise E4360-3 512KB 7200RPM	$650
4.3GB UltraWide SCSI-2 Enterprise E4360-7 512KB 7200RPM	$655

Quantum

2.1GB FireBall ST32160A EIDE UltraDMA 10ms, 5400RPM	$185
3.2GB FireBall ST33240A EIDE UltraDMA 10ms, 5400RPM	$225
4.3GB FireBall ST34320A EIDE UltraDMA 10ms, 5400RPM	$270
6.5GB FireBall ST36480A EIDE UltraDMA 10ms, 5400RPM	$365
2.1GB FireBall ST32160S Ultra-SCSI 10ms, 5400RPM	$230
3.2GB FireBall ST33240S Ultra-SCSI 10ms, 5400RPM	$315
4.3GB FireBall ST34320S Ultra-SCSI 10ms, 5400RPM	[illegible]
6.5GB FireBall ST36480S Ultra-SCSI 10ms, 5400RPM	$505
4.5GB Viking VK34550N Ultra SCSI-2, 8ms, 7200RPM	$720
4.5GB Viking VK34550W Ultra Wide SCSI-2, 8ms, 7200RPM	$730
9.1GB Atlas AL39100N Ultra SCSI-2, 8ms, 7200RPM	$1195
9•.1GB Atlas AL39100W Ultra Wide SCSI-2, 8ms, 7200RPM	$1205

Seagate

2.26GB Barracuda 4LP ST322•72N Ultra SCSI-2 50pin 7200RPM, 512K	[illegible]
2.26GB Barracuda 4LP ST32272W Ultra Wide SCSI-2 68pin 7200RPM, 512K	$525
4.55GB Barracuda 4LP ST34572N Ultra SCSI-2 50pin 7200RPM, 512K	$740
4.55GB Barracuda 4LP ST34572W Ultra Wide SCSI-2 68pin 7200RPM, 512K	$755
9.1GB Barracuda9 ST19171N Ultra SCSI-2 50pin 7200RPM, 512K	$1250
9.1GB Barracuda9 ST19171W Ultra Wide SCSI 68pin 7200RPM, 512K	$1265
4.55GB Cheetah AV ST34501N Ultra SCSI-2 8.5MS,10000RPM	$830
4.55GB Cheetah AV ST34501W UltraWide SCSI 68pin 7.5MS,10000RPM	$835
9.1GB Cheetah AV ST19101N Ultra SCSI-2 7.5MS,10000RPM	$1515
9.1GB Cheetah AV ST19101W UltraWide SCSI 7.5MS,10000RPM	$1525

MicroPolis

4.5GB TomaHawk 4LP 4345NS Ultra SCSI-2 50pin 7200RPM,8ms, 512K	$595
4.5GB TomaHawk 4LP 4345WS UltraWide SCSI-2 68pin,7200RPM,8ms, 512K	$615
9.1GB TomaHawk9 3391NS Ultra SCSI-2 50pin, 7200RPM, 8ms, 512K	$995
9.1GB TomaHawk9 3391WS Ultra Wide SCSI-2 68pin, 7200RPM, 8ms, 512K	$1030

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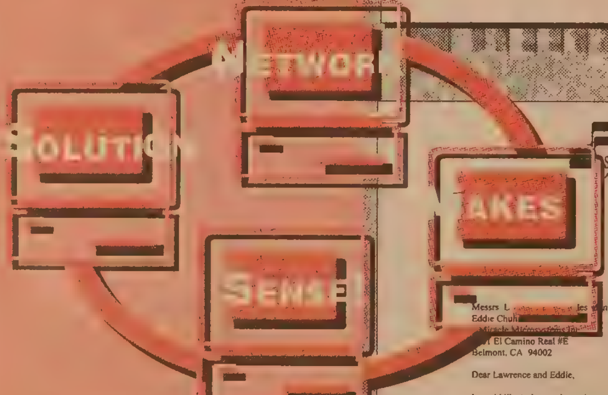
EQUIPMENT SETUP/CUSTOMIZATION
SOFTWARE DESIGN/INSTALLATION
POWER AND DATA PROTECTION
USER/ADMINISTRATOR TRAINING
EXPERTISE TECHNICAL SUPPORT
MAINTAINENCE CONTRACT

MIS GUYS, WE KNOW YOU ARE TIRED! YOUR COMPANY DEPENDS ON YOUR NETWORK AND YOUR NETWORK DEPENDS ON YOU! YOU ARE PAYING YOUR CONSULTANT TO EXPERIMENT WITH YOUR HARDWARE! YOUR HARDWARE PROVIDER IS CLAIMING YOUR PROBLEM IS SOFTWARE RELATED BUT YOUR SOFTWARE VENDOR SAYS IT IS NOT! AND YOUR BOSS IS PULLING YOUR HAIR!
YOU THOUGHT IT WAS EASY? WISH YOU HAVE KNOWN THE COMPATIBILITY PROBLEM FOR YOUR NON-RETURNABLE PURCHASE? WISH YOUR CONSULTANT HAVE KNOWN IT ALL?

DON'T YOU KNOW CONSULTANTS COME TO UMIRACLE WHEN THEY NEED HELP?
DON'T YOU KNOW YOU CAN SAVE MONEY BY SKIPPING YOUR VAR?
DON'T YOU KNOW YOU CAN SIT BACK AND RELAX IF UMIRACLE PROVIDES YOU A COMPLETE, HASSLE-FREE VERTICAL SOLUTION?



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UMiracle Microsystems Corporate Office
44063 Fremont Blvd. Fremont CA 94538
Phone: 510-226-3666 Fax: 510-226-6758

EQUIPMENT BUSINESS LEASE APPLIES TO EQUIPMENT, CABLING & SETUP LABOR ALTOGETHER. LEASE PAYMENT IS BASED ON $1 PURCHASE PURCHASE OPTION ONE TIME $75 DOCUMENTATION FEE ARE REQUIRED. TWO ADVANCED PAYMENTS REQUIRED IF APPROVED. TAXES ARE NOT YET INCLUDED.

5 + PEER2PEER NETWORK SOLUTION

- *FIVE ASUS TX97 AMD-K5 166MHz WorkStations w/Licensed Windows 95*
  (See Previous Pages for Workstation Configuration Details)
- *FIVE Intel EtherExpress 100BaseT PCI Network Interface Adapters Installed*
- *Up to 500' Catalog-5 100BaseT UTP Cabling (InWall w/ Plates - 5 Nodes)*
- *10BaseT 8-Port Hub*
- *HP LaserJet 5 Printer*
- *OnSite Windows 95 Peer to Peer Network Resources and Printer Setup*

Recommended Options:
- *100BaseT 8-Port Hub*
- *Internet Access + EMail Solution*
- *Network User + Administrator Training*
- *3 Month 8-Hour Response Service Maintainence Contract*

$7019 or
EQUIPMENT BUSINESSLEASE*
FOR AS LOW AS $\$195^{12}$ PER MONTH 48 MONTHS

10 + ONE NETWORK SOLUTION

- *TEN ASUS TX97 AMD-K5 166MHz WorkStations w/Licensed Windows 95*
- *ONE ASUS P2L97 Pentium II 266MHz AGP File Server w/25 User Licensed NT4.0 Server*
  (See Previous Pages for Workstations and Server Configuration Details)
- *ELEVEN Intel EtherExpress 100BaseT PCI Network Interface Adapters Installed*
- *HP LaserJet 5N WorkGroup Printer w/10BaseT Connection to Server*
- *3COM 3C250B-TX 12-Port 100BaseT Stackable Hub*
- *APC Smart-UPS VS420 Un-interruptable Power Supply w/ Setup*
- *Up to 1100' Catalog5 100BaseT UTP Cabling (InWall w/ Plates - 11 Nodes)*
- *OnSite Windows NT WorkGroup Network Resources and Printer Setup*

Recommended Options:
- *Internet Acces + EMail Solution*
- *3 KeyStroke Recovery Backup Solution*
- *Fax Server Solution*
- *Network User + Administrator Training*
- *6 Month 8-Hour Response Service Maintainence Contract*

$17521 or
EQUIPMENT BUSINESSLEASE*
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20 + ONE NETWORK SOLUTION

- *TWENTY Intel Anchorage w/Audio Pentium 166MMX WorkStations w/Licensed Windows 95*
- *ONE Intel Providence PentiumPro File Server w/ One PentiumPro 180MHz CPU w/25 User Licensed NT4.0 Server with Dual 100BaseT PCI NICs each connected to 100BaseT hub for double thoroughput*
  (See Previous Pages for Workstations and Server Configuration Details)
- *TWENTY-TWO Intel EtherExpress 100BaseT PCL Network Interface Adapters Installed*
- *ONE HP LaserJet 5M WorkGroup Printer w/10BaseT Connection to Server*
- *TWO 3COM 3C250B-TX 12-Port 100BaseT Stackable Hub*
- *APC Smart-UPS VS650 Un-interruptable Power Supply w/ Setup*
- *Up to 2100' Cat5 100BaseT UTP Cabling (InWall w/ Plates - 21 Nodes)*
- *OnSite Windows NT WorkGroup Network Printer and Resources Setup*

Recommended Options:
- *Internet Acces + EMail Solution*
- *3 KeyStroke Recovery Backup Solution*
- *Fax Server Solution*
- *Network User + Administrator Training*
- *6 Month 8-Hour Response Service Maintainence Contract*

$40499 or
EQUIPMENT BUSINESSLEASE*
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40 + ONE NETWORK SOLUTION

- *FORTY Intel Anchorage w/Audio Pentium 166MMX WorkStations w/Licensed Windows 95*
- *One RAID-5 Dual PentiumPro 200MHz-256K File Server w/45 User Licensed NT4.0 Server with Adaptec ANA-6940 Quad 100BaseT Port PCI Adapter for quadruple thoroughput*
  (See Previous Pages for Workstations and Server Configuration Details)
- *FORTY Intel EtherExpress 100BaseT PCI Network Interface Adapters Installed*
- *ONE HP LaserJet 5SiMX Departmental Printer w/10BaseT Connection to Server*
- *FOUR 3COM 3C250 12-Port 100BaseT Stackable Hubs*
- *APC Smart-UPS VS1000 Un-interruptable Power Supply w/ Setup*
- *Up to 4100' Catalog5 100BaseT UTP Cabling (InWall w/ Plates - 41 Nodes plus Wiring Rack)*
- *OnSite Windows NT WorkGroup Network Printer & Resources Setup*

Recommended Options:
- *Internet Acces + EMail Solution*
- *3 KeyStroke Recovery Backup Solution*
- *Fax Server Solution*
- *Network User + Administrator Training*
- *12 Month 8-Hour Response Service Maintainence Contract*

$100004 or
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INTERNET ACCESS+EMAIL SOLUTION

INTERNET PROVIDES POWER TO BUSINESS USERS LIKE YOU! EXPLORING YOUR IDEA, GO TO INTERNET! RESEARCHING YOUR PROJECT, GO TO INTERNET! MAKING AN INTERNATIONAL CALL, GO TO INTERNET! ONCE YOU HAVE IT, YOU WILL HOOK ON IT. AND TO HOOK ON IT CHEAP, YOU NEED ISDN INTERNET ACCESS FROM UMIRACLE. WE WILL SETUP YOUR ISDN LINE, GET YOU THE RIGHT ROUTER, SETUP YOUR ISP ACCESS ACCOUNT, SETUP YOUR EMAIL ADDRESSES, CONFIGURE YOUR NETWORK WITH TCPIP PROCOTOL, ALL FOR ONE PACKAGE PRICE! CALL UMIRACLE NETWORK SOLUTION FOR DETAILS!

3-KEYSTROKE RECOVERY BACKUP SOLUTION

YOU THINK YOU GOT IT ALL BACKED UP? NOT UNTIL THE DAY YOUR SERVER CRASHES YOU WILL FIND OUT YOU HAVE TO 1.) TROUBLESHOOT AND REPLACE YOUR DEFECTIVE COMPONENTS, 2.) RELOAD YOUR NOS, DRIVERS, APPICATIONS AND BACKUP SOFTWARE, 3.)RESTORE YOUR DATA FILES FROM BACKUP, 4.)RECONSTRUCT YOUR USER AND PRINTER ACCOUNTS, AND 5.)EXPECT MISSING AND CORRUPTED DATA HERE AND THERE! WHY? BECAUSE YOUR BACKUP SOFTWARE BACKS UP ONLY DATA FILES, NOT THE OPENED FILES, NOT THE SECURITY DATABASE OR PARTITION INFORMATION! BACKUP SOFTWARE DON'T MAKE SENSE UNTIL NOW! WITH REPLICA V3 BY STAC, YOU CAN BACKUP YOUR HARDDRIVE PARTITIONS AS OBJECTS, RESCUE YOUR DISASTER WITH 3 KEYSTROKES FROM A RECOVERY DISK, EVEN FROM A LOW-LEVEL-FORMATED HARDDRIVE, AND BRING YOUR SERVER UP IN HOURS! TO FIND OUT HOW WE CAN PROVIDE THIS SOLUTION, CALL US NOW!

FAX SERVER SOLUTION

DON'T WAIT IN LINE FOR YOUR TURN TO FAX, DON'T HAND-WRITE YOUR COVER PAGE! FAX DIRECTLY FROM YOUR DESKTOP, NEATLY AND PROFESSIONALLY! WITH THE RIGHT FAX SOLUTION, YOU CAN RECEIVE YOUR FAX AND PRINT RIGHT TO YOUR LASER PRINTER, REPRINT YOUR 6 MONTHS OLD FAX, FAX YOUR DOCUMENTS FROM YOUR WINDOWS APPLICATION JUST LIKE PRINTING. ALL VIA ONE LINE, ONE MODEM! FORGET ABOUT BRINGNG A LINE AND A MODEM TO EVERY DESKTOP! WITH WINFAX PRO FOR NETWORKS (NON-DELICATED) AND SATISFAXTION FAXBOARD, AND UMIRACLE NETWORK SOLUTION TECHNICAL EXPERTISE, WE SURE CAN GET YOU THE BEST SOLUTION! CALL US FOR DETAILS!

WE MONITOR THE TRENDS OF EVERY TECHNOLOGY IN THE INDUSTRY AND GET YOU THE BEST! GUARANTEE WE WILL TAKE IT BACK IF IT DOESN'T WORK!

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EXCHANGE YOUR 72 PIN SIMMS TO 168 PIN DIMMS,
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Web Page Listings

continued from page 174

Allradion: Radio For The 21st Century *http://www.allreadio.com* All music, all the time. Unsigned bands—win a recording contract in our future star search. [Exp. #171.]

Anita's StarPower *http://home.earthlink.com/~astrology* Free astrology readings by the astrologer to Carlos Castaneda, Yogi Bhajan, Liza Minelli, and the stars of Hollywood. [Exp. #172.]

Arizona Cactus Home Page *http://www.arizonacactus.com* A fun and informative page about a botanical garden in Arizona. [Exp. #172.]

Bay Area Sports *http://www.angelfire.com/sc/starzsports/index.html* All you want to know about your favorite Bay Area athletes and teams here. [Exp. #171.]

Bay Scene Magazine *http://www.bayscene.com* Musicians supporting musicians. [Exp. #172.]

Beep @ The BBC *http://www.beeb.com* The BBC's Web entertainment and information service. [Exp. #172.]

Brainless *http://www.brainless.org* Multimedia organism for wasting time by browsing weird jokes, weird images, weird music, and weird sounds. [Exp. #172.]

Bumps Ski & Surf Australia *http://www.bumps.com.au* Ski, surf, snowboarding, inline skating specialist retailer. [Exp. #171.]

Carolina Corner *http://www.carolinacorner.com* Features businesses, recreation, and tourism in ten counties of Northwestern North Carolina. [Exp. #173.]

Charles Belov's MIDI Web Tips Home Page *http://www.geocities.com/SunsetStrip/4294/MIDI.html* Technical info for all who use or support MIDI on the Web. MIDI test suite. [Exp. #171.]

Citibank Women's Challenger—A USTA Event *http://www.6all.com* Site to promote a professional tennis tournament held in the South Bay. [Exp. #171.]

Communication Graphics And Music *http://www.bulletcomputers.com/gtittle* Features musician links, musician special interest pages, street music articles, and more. [Exp. #171.]

Cooking For Dummies Home Page *http://www.globalpac.com/unriehl* America's first cooking show for really stupid people. [Exp. #171.]

Crashed Tickets *http://www.crashedtickets.ch* The wildest and hardest acappella band you ever heard. [Exp. #172.]

Da-Zone Download Station *http://www.da-zone.com* [Exp. #173.]

Dark Skies At PlanetENZ *http://planetenz.com/darkskies* The official Web site of the Save Dark Skies Campaign. [Exp. #173.]

Dee Zaster, Esq. *http://members.tripod.com/~russmccor/* The DZ gal strikes again—this time in Europe. [Exp. #171.]

Discoteca ULTIMO IMPERO *http://www.workline.it/impero* [Exp. #171.]

DR's Sports *http://www.signatures.com* The best "in-person" sports and celebrity autographs on the Internet. [Exp. #171.]

Earthquake City BBS *http://members.tripod.com/~eqcitybbs/Index.htm* Earthquake City BBS, Computers By Candlelight (radio show), Chrome Oxide music collector pages, lots of links. [Exp. #171.]

Foris Adventures *http://www.foris.com* Learn about adventure travel to Borneo, and the sights and cultures around Southeast Asia. [Exp. #171.]

Free Music Newsletter & Sound Clips *http://www.citysketches.com/clips.htm* [Exp. #172.]

Gallery Of Cats *http://www.dreamtek.com/gallery-of-cats* Provides gifts and collectibles of the best quality, craftsmanship, and uniqueness of cats. [Exp. #171.]

Halfmoon Bay Cabin, British Columbia *http://www2.portal.ca/~perbus/* Waterfront luxury vacation rentals. [Exp. #171.]

Home Of Duplicate Solitaire *http://www2.cruzio.com/~vagabond* Duplicate solitaire has finally arrived. Play Klondike Pro against robots, friends and live opponents. [Exp. #172.]

House Of CrimsonHaze *http://www.homeusers.prestel.co.uk/mikeroweweb* Multiplayer game site. [Exp. #172.]

Ice House Comedy Club *http://www.icehouseonline.com/* Voted #1 entertainment nightspot four years in a row by *Cheers* magazine. [Exp. #172.]

It's The New Zoo Revue *http://www.newzoorevue.com/* From the hit children's show of the '70s comes the classic NZR on the Internet. [Exp. #172.]

It's Party Time *http://www.dancersalacarte.com* The Bay Area's premier variety entertainment service. Dancers, musicians, catering, limo and party location referrals available. [Exp. #172.]

KZ Mobile Entertainment Services *http://pw2.netcom.com/~lilalynn/KARAOKEZONE.html* KJ's/DJ's, vocal acts, photographer, etc.; Karaoke show listings and equipment distributor. [Exp. #172.]

Look, Learn, And Do *http://www.looklearnanddo.com/* Fun projects, history, and books for kids. [Exp. #172.]

Louise Brooks Society *http://www.pandorasbox.com* Louise Brooks is best known for her role as Lulu in the classic silent film, *Pandora's Box.* [Exp. #171.]

Melrose Symphony Orchestra *http://www.melroseso.org* The oldest continuing volunteer orchestra in the nation. [Exp. #171.]

Mercy International Centre, Dublin, Ireland *http://indigo.ie/~mercyint* Global headquarters of The Sisters of Mercy. [Exp. #171.]

Movie & Music Mayhem *http://www.geocities.com/hollywood/academy/6523* This site is for lovers of alternative music. [Exp. #172.]

Muddy River Bridge *http://members.aol.com/mosesdan/muddyriverbridge/index.html* The weekly comic strip, Muddy River Bridge, and other related art by Dan Moses. [Exp. #172.]

Napa Gardens Experience *http://www.napagardens.com* Live the lifestyle of the Napa Valley with home furnishings, gourmet foods and wineries. [Exp. #171.]

Norbest Home Page *http://www.norbest.com/* Norbest is the world's largest turkey marketing cooperative. This Web site aims to prove that turkey is not just for Thanksgiving. [Exp. #172.]

NRR, Inc. *http://www.newrealm.com* Music production at its finest. [Exp. #173.]

Official Site of the 79th PGA Championship *http://www.pga97.com* Live cyber-casted event featuring live scoring, course info, player info, and news. [Exp. #171.]

On Computers *http://www.oncomputers.msn.com* Web site where surfers can get facts and info about the radio show, "On Computers," as well as listen to the broadcast via Real Audio. [Exp. #171.]

OnVideo *http://www.cyberpod.com/cyberpod/onvideo.htm* A complete home video guide to current and forthcoming movies released on tape. [Exp. #171.]

Pickle Bandit's Barrel *http://www.geocities.com/SoHo/5974* [Exp. #172.]

Pinnacle Records Online Selecta *http://www.Pinnacle-Records.co.uk* A listening post for new albums and singles. [Exp. #171.]

Plan 10 Software *http://www.plan10.com* The home of MazeWorks, a maze race game and maze generation tool. Automatically generate DOOM levels! [Exp. #172.]

Rebelcat's Litterbox *http://www.geocities.com/SouthBeach/Lights/4439/* Rebelcat loves industrial, gothic, and alternative music; sports; the beach; and surfin' the Net. [Exp. #171.]

Royal Vacations, Inc. *http://royalvacations.com* [Exp. #173.]

San FranZiskGo Events Listings *http://www.transaction.net/sanfran/events* San FranZiskGo!, updated weekly, previews one cool event for every day in San Francisco. [Exp. #171.]

Serious Gamer's *http://www.seriousgamers.com/* Includes links and reviews dedicated to all manner of serious PC games and much more. [Exp. #172.]

The Site Fights *http://www.thesitefights.com* Web masters submit their sites, which are then inspected for content and entered into contests if it is free of vulgar language and material. [Exp. #172.]

Ski France *http://www.french-ski.com* Info on skiing the French Alps. [Exp. #172.]

Smartweb In Paris *http://www.smartweb.fr* Guide and virtual visit of Paris, museums, monuments, shopping, and fashion. [Exp. #173.]

Southern California Christian Entertainment *http://home.earthlink.net/~christent/* Secular and Christian software, books, movies, and event reviews from a Christian family perspective. [Exp. #172.]

Spec Screenplay Web Site *http://www.gotmilkstuff.com/shop/specscript.html* Screenwriters! Everything you need to know about the spec screenplay marketplace. Updated monthly. [Exp. #172.]

Teahouse Of The Mullah Nasrudin's Donkey *http://www.dnai.com/~mr_cat* Authentic Turkish coffee house at the Renaissance Faire. [Exp. #171.]

Telery *http://www.telery.com* A place to chat, play games, and have fun with your friends! Live chat, a casino, online games, free email and home pages! [Exp. #171.]

TLH Heliskiing *http://tlhheliskiing.com* Helicopter skiing in Canada. [Exp. #171.]

Today's Game *http://www.bonus.com/etc/todays_game/* Offers a new kind of coffee break—an interactive game everyday, delivered directly to the player's email. [Exp. #171.]

Tom Servo's MST3K Page *http://www.geocities.com/Area51/Dimension/3512* For fans of "Mystery Science Theater 3000," includes links; hot info, and much more. [Exp. #171.]

The Tour-Biz *http://home1.gte.net/tstudios/e-book.html* Travel the world for free! New book, in computer format, explains how to build, sell, and manage a successful tour. [Exp. #173.]

Trinity Alps Vacation Rental *http://www.life-education.com* The Coffee Creek Chalet is on the river nestled in a forest setting. Year-round relaxation. [Exp. #172.]

Trivial Net *http://www.trivial.net* Trivia just for nerds. [Exp. #172.]

UAE *http://members.tripod.com/~ALKETBI/gold1.htm* UAE: one of the most wonderful countries in the world! [Exp. #171.]

The Ultimate Simpson Site *http://www.apc.net/rsmith/simpsons.htm* A site for Simpson lovers. Movies, pictures, sounds, chatting, etc. [Exp. #172.]

Unofficial Heckler & Koch Home Page *http://www.w3systems.com/usp/usp.html* Information about Heckler & Koch firearms along with general shooting information. [Exp. #171.]

Yanahurco—Ecological Reserve *http://www.yanahurco.com.ec* A private ecological reserve for ecotourism including fishing, horseback riding, bird watching, and camping. The Galapagos of the Andes, 60 miles from Quito, Ecuador. [Exp. #173.]

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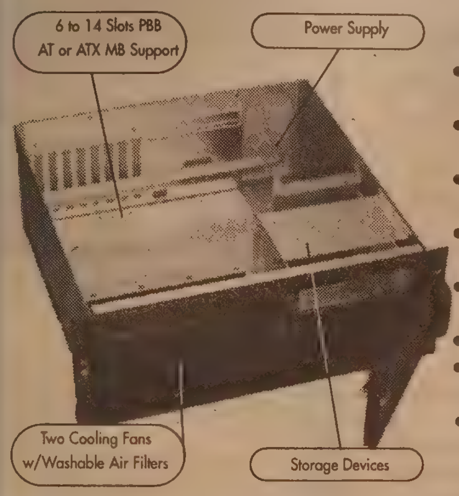
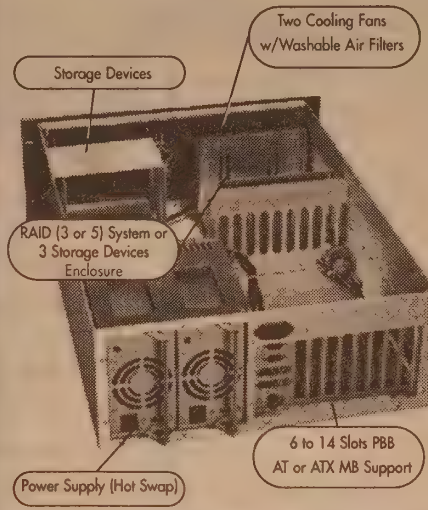
19" RACKMOUNT ENCLOSURE


6 to 14 Slots PBB AT or ATX MB Support
Power Supply
Two Cooling Fans w/Washable Air Filters
Storage Devices

Specifications:

- Faceplate Dimensions: 19"W x 7"H
- Chassis Dimensions: 17"W x 7"H x 17"D
- Weight: 15 lbs. w/o Power Supply
- Peripherals: Up to 4 Storage Devices
- Steel & Aluminum Construction
- Power Supply
- Cooling Fans: Two 60 CFM Intake Fans
- Expansion: PCI/ISA Passive Backplane (6-14 slots), Segmented up to 2 systems

19" RACKMOUNT ENCLOSURE

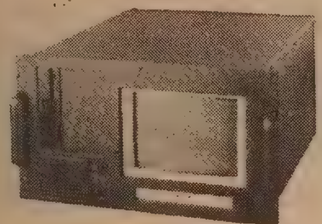

Two Cooling Fans w/Washable Air Filters
Storage Devices
RAID (3 or 5) System or 3 Storage Devices Enclosure
6 to 14 Slots PBB AT or ATX MB Support
Power Supply (Hot Swap)

Specifications:

- Steel & Aluminum Construction
- Faceplate Dimensions: 19"W x 7"H
- Chassis Dimensions: 17"W x 17"H x 24"D
- Weight: 17 lbs. w/o Power Supply
- Expansion: PCI/ISA Passive Backplane (6-14 slots)
- Power Supplies: 230,250, 300 to 400W Hot Swapable Power Supply (250-400W optional)
- Cooling Fans: Two 60 CFM Intake Fans
- RAID Level 5 11.2GB HD
- Door: Dustproof & Lockable
- Up to Nine Storage Devices

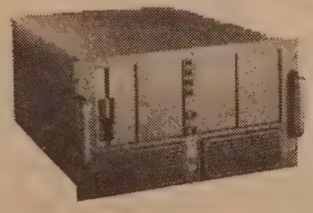
MADE IN U.S.A.

19" RACKMOUNT w/MONITOR



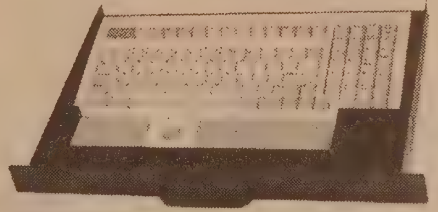
- 19" Rackmounting
- Integral Monitor
- 10".28 dot pitch SVGA Color
- 9" Mono-TTL or VGA
- 8 or 14 Slot Passive Backplane
- 8 Slot Motherboard Mounting
- U.S.A. Manufactured

HARD DISK CD-ROM ENCLOSURE



- 8, 14 & 20 Slot Options
- Dual Power Supplies
- Hot Swappable Redundant Power Supplies (Optional)
- 8 Drive Bays
- 8 Fans
- Motherboard or Passive Backplane
- 200-600 Watt Power Supply
- U.S.A. Manufactured

19" RACKMOUNT KEYBOARDS



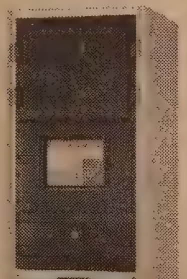
RMK-102

- Space for Mouse or Trackball
- Switch Selectable for PC XT/AT or PS/2
- 20,000,000 Life Cycles per switch
- Separate Numeric and Cursor Keys
- Twelve Function Keys
- Suplied 22" Sliding Rail for 19" Rack
- 19" (W) x 1.75 (H) x 16.5" (D)

RMK-102TB w/ Trackball

- Compatibility: Microsoft &/or PS/2 PDP
- Interface: RS-232C or PS/2 PDP
- Connector: DB-9 Serial or 6-pin Mini DIN
- Encoder: Opto-mechanical
- Tracking Speed: 500mm/sec. (20"/sec.)
- Switch Lifetime: 1 Million Cycle
- 19" (W) x 1.75 (H) x 16.5" (D)

RACK MOUNT CABINETS



From 21"–78" Available

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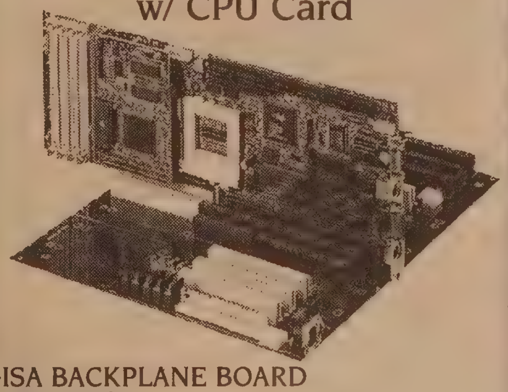

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-PCI BACKPLANE BOARD
8, 14, 20 Slots
-Segmented Backplane Available

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- POWER SUPPLY: 100-240V

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SVGA
Mono
Paper White

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512K PB Cache
Teac 1.44MB FDD
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Mini Tower w/230W power supply

Pentium®-150MHz.	**$238**
MMX-166	**$285**
MMX-200	**$389**
AMD K6-166	**$275**
AMD K6-200	**$344**

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Networking welcome!

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TX MMX 233 Motherboard
Sound Blaster 16 Sound Card
S3 Virge 2MB Graphic card
430TX chip, 512K Pipelined Cache
Mitsumi 16X CD ROM
Intel Pentium®, AMD K6 or IBM Processor
Cooling fan for CPU
16 MB EDO RAM
2.6GB Ultra DMA33 Hard Drive
1.44MB Teac Floppy Drive
Deluxe 767 Mid Tower
Mitsumi 104 Keyboard
60w Amplified Speaker
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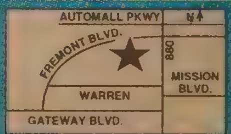

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PP-200C (INTEL VENUS M/B) ATX	118	578	748	768	808	888	898	918	1038	1188
PP-180C (SUPER MICRO M/B)	218	388	538	558	598	678	688	708	828	978
MMX-P233/512K (Intel Lonetree M/B) ATX (Anchorage: +$10)	168	498	N/A	N/A	748	848	N/A	N/A	1228	1398
MMX-P200/512K (Intel Lonetree M/B) ATX (Anchorage: +$10)	168	418	N/A	N/A	668	768	N/A	N/A	1148	1318
MMX-P166/512K (Intel Lonetree M/B) ATX (Anchorage: +$10)	168	318	N/A	N/A	568	668	N/A	N/A	1048	1218
P5-200C (INTEL MARL M/B) ATX (Tucson: +$70)	108	278	448	468	508	588	598	618	738	888
P5-166C (INTEL MARL M/B) ATX (Tucson: +$70)	108	238	408	428	468	548	558	578	698	848
P5-150C (INTEL MARL M/B) ATX (Tucson: +$70)	108	208	378	398	438	518	528	548	668	818
MMX-P233/256K (SUPER MICRO M/B)	124	458	588	608	648	728	738	758	878	1028
MMX-P200/256K (SUPER MICRO M/B)	124	368	498	518	558	638	648	668	788	938
MMX-P166/256K (SUPER MICRO M/B)	124	268	398	418	458	538	548	568	688	838
MMX-P233/256K (ASUS VX97 M/B) (ASUS TX97: +$60)	98	428	558	578	618	698	708	728	848	998
MMX-P200/256K (ASUS VX97 M/B) (ASUS TX97: +$60)	98	348	478	498	538	618	628	648	768	918
MMX-P166/256K (ASUS VX97 M/B) (ASUS TX97: +$60)	98	248	378	398	438	518	528	548	668	818
MMX-P233/512K (INTEL TRITON TX)	84	408	538	558	598	678	688	708	828	978
MMX-P200/512K (INTEL TRITON TX)	84	328	458	478	518	598	608	628	748	898
MMX-P166/512K (INTEL TRITON TX)	84	228	358	378	418	498	508	528	648	798
AMD K6-P233/512K (INTEL TRITON TX)	84	438	568	588	628	708	718	738	858	1008
AMD K6-P200/512K (INTEL TRITON TX)	84	258	388	408	448	528	538	558	678	828
AMD K6-P166/512K (INTEL TRITON TX)	84	208	338	358	398	478	488	508	628	778
P5-200C (INTEL TRITON VX)	64	238	368	388	428	508	518	538	658	808
P5-166C (INTEL TRITON VX)	64	198	328	348	388	468	478	498	618	768
P5-150C (INTEL TRITON VX)	64	158	288	308	348	428	438	458	578	728
6X86-P200+/512K (INTEL TRITON TX)	84	148	278	298	338	418	428	448	568	718
6X86-P166+ (INTEL TRITON VX)	64	128	258	278	318	398	408	428	548	698
AMD K5-166C (INTEL TRITON VX)	64	158	288	308	348	428	438	458	578	728
AMD K5-100C (INTEL TRITON VX)	64	128	258	278	318	398	408	428	548	698
486DX4-100C VLB-PCI	54	94	224	244	284	364	374	394	514	664

HI-TECH STARTER
MULTIMEDIA SYSTEMS

- **16MB RAM** (32MB: Add $50)
- **1.2GB EIDE** (2.0GB/4.3GB: Add $40/$100)
- **16X CD-ROM** (24X: Add $20)
- **Trident 1MB**
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- **16 Bit 3D Sound Card**
- **Deluxe Speakers**
- TEAC 1.44MB 3.5" Floppy Drive
- Mitsumi Keyboard for Windows 95
- Enhanced Case w/Power Supply
- Free Mouse and Microsoft Windows 95
- Free CD Deluxe Pack
- Monitor Sold Separately (please see next page)

Internet Ready!

AMD K6-233/512K (Intel Triton TX)....908
AMD K6-200/512K (Intel Triton TX)....728
AMD K6-166/512K (Intel Triton TX)....678
P5-200/256K (Intel Triton VX) 718
P5-166/256K (Intel Triton VX) 668
P5-150/256K (Intel Triton VX) 638
6X86-P200+/512K (Intel Triton TX) ..628
6X86-P166+/256K (Intel Triton VX)..608
AMD K5-P166/256K (Intel Triton VX).638
AMD K5-P100/256K (Intel Triton VX).608

See Next Page for All of Our Upgrade Prices

HI-TECH DELUXE
MULTIMEDIA SYSTEMS

- **32MB EDO RAM** (64MB: Add $90)
- **2.0GB EIDE** (4.3GB: Add $70)
- **16X CD-ROM** (24X: Add $20)
- **Diamond Edge 3D 2MB**
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- **Sound Blaster 16 PNP**
- **Deluxe 60W Speakers**
- TEAC 1.44MB 3.5" Floppy Drive
- Mitsumi Keyboard for Windows 95
- Medium Tower Case w/Power Supply
- Free Microsoft Windows 95 and Mouse
- Free CD Deluxe Pack
- Monitor Sold Separately (please see next page)

MMX-P233/512K (Intel Tucson) ATX 1158
MMX-P200/512K (Intel Tucson) ATX 1078
MMX-P233/256K (Super Micro).......1068
MMX-P200/256K (Super Micro) 988
MMX-P166/256K (Super Micro) 888
MMX-P233/512K (Intel Triton TX)...1018
MMX-P200/512K (Intel Triton TX).....938
MMX-P166/512K (Intel Triton TX).....838
P5-166/512K (Intel Triton TX) 818
P5-150/512K (Intel Triton TX) 788

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HI-TECH DREAM
MULTIMEDIA SYSTEMS

- **32MB EDO RAM** (64MB: Add $Call)
- **4.3GB EIDE Hard Drive** (6.4GB: Add $100)
- **24X CD-ROM**
- **Matrox Millenium II 4MB**
- **56.6 Internal Fax Modem (Internet Ready)**
- **Sound Blaster 32 PNP**
- **Deluxe 180W Speakers**
- TEAC 1.44MB 3.5" Floppy Drive
- Keytronics Keyboard for Windows 95
- Medium Tower Case or w/Power Supply
- Free Microsoft Windows 95 and Mouse
- Free CD Deluxe Pack
- Monitor Sold Separately (please see next page)

Pentium II-300 (Intel Atlanta) ATX 1988
Pentium II-300 (Asus M/B) ATX 1948
Pentium II-266 (Asus M/B) ATX 1698
Pentium II-266 (Intel Portland) ATX 1698
Pentium II-233 (Intel Portland) ATX 1618
MMX-P233/512K (Intel Lonetree) ATX 1458
MMX-P200/512K (Intel Lonetree) ATX 1378
MMX-P233/256K (Asus TX 97)..........1408
MMX-P200/256K (Asus TX 97)..........1328
MMX-P166/256K (Asus TX 97)..........1228

See Next Page for All of Our Upgrade Prices

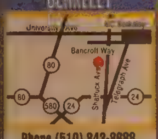
HI-TECH POWER
MULTIMEDIA SYSTEMS

- **64MB EDO RAM**
- **4.3GB EIDE Hard Drive** (6.4GB: Add $100)
- **24X CD-ROM**
- **ATI Pro Turbo 8MB**
- **US Robotics 56.6 Fax Modem (Internet Ready)**
- Sound Blaster AWE 64 Value or Yamaha Sound
- Yamaha Speakers
- TEAC 1.44MB 3.5" Floppy Drive
- Keytronics Keyboard for Windows 95
- Medium Tower Case or w/Power Supply
- Free Microsoft Windows 95 and Mouse
- Free CD Deluxe Pack
- Monitor Sold Separately (please see next page)

Pentium II-300 (Intel Atlanta) ATX 2128
Pentium II-266 (Intel Atlanta) ATX 1898
Pentium II-300 (Asus M/B) ATX 2098
Pentium II-266 (Asus M/B) ATX 1868
Pentium II-266 (Intel Portland) ATX 1848
Pentium II-233 (Intel Portland) ATX 1768
MMX-P233/512K (Intel Anchorage) ATX 1608
MMX-P200/512K (Intel Anchorage) ATX 1528
PP-200 (Intel Venus) ATX.........................1678
PP-180 (Intel Venus) ATX.........................1408

See Next Page for All of Our Upgrade Prices

BERKELEY



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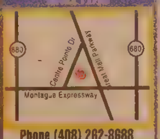

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CASE W/POWER SUPPLY

230W / 250W / 300W Power Supply	$19 / 21 / 32
Mini Tower Case w/200W Power Supply	22
Desktop AT Case w/200W Power Supply	33
Medium Tower Case w/230W Power Supply	35
Full Tower Case w/250W Power Supply	49
ATX Case w/Power Supply (Tower / AT)	59 / 85

CONTROLLERS

IDE 2FD/2HD with 2S/1P/1G	$11

adaptec

1520 / 1542 CP (SCSI)	$64 / 158
2842 VLB (SCSI)	78
2940 / 2940U PCI (SCSI)	154 / 163
2940UW PCI (SCSI)	184

DATA TECHNOLOGY CORPORATION

DTC 2280E ISA with 16550 UART Chip	$19

PROMISE TECHNOLOGY, INC.

Promise DC-2300 Plus VLB IDE Fast I/O	$43
Promise DC-4030 VLB IDE Cache Controller	48
Promise DC-4030+ VLB EIDE	110

HARD/FLOPPY DRIVES

Quantum™ Maxtor Seagate WESTERN DIGITAL

IDE 1.0GB / 1.2GB / 1.7GB	$104 / 114 / 128
IDE 2.0GB / 2.5GB	140 / 162
IDE 4.3GB / 6.4GB	208 / 314
SCSI 1.0GB / 1.2GB / 2.0GB	174 / 180 / 204
SCSI 4.0GB / 9.0GB	318 / 968
FUJITSU IDE 1.7GB	130
JTS IDE 1.0GB / 1.2GB	104 / 114
JTS IDE 1.7GB / 2.0GB / 2.5GB	136 / 140 / 162
MAXTOR IDE 2.5GB / 3.2GBN	166 / 198
MAXTOR IDE 4.3GB / 7.0GB	240 / 348
QUANTUM	
IDE 2.5GB / 4.3BG Big Foot	168 / 208
IDE 3.1GB / 3.8GB / 6.4GB	208 / 228 / 314
SCSI 1.0GB / 1.2GB	174 / 194
SCSI 2.0GB / 4.3GB	208 / 318
SAMSUNG	
IDE 1.0GB / 1.2GB	104 / 116
IDE 2.0GB / 2.5GB	154 / 162
SEAGATE	
IDE 1.6GB / 2.0GB	158 / 168
SCSI 9.1GB	968
WESTERN DIGITAL	
IDE 1.6GB / 2.0GB	154 / 170
IDE 2.5GB / 3.2GB / 4.3GB	192 / 208 / 254
FLOPPY DRIVES	
Mitsumi / Teac 1.44 Floppy Drive	$18 / 20

MOUSE

3-Button Mouse Microsoft Compatible	$5

LOGITECH

First Mouse (Serial-2 Button)	9
Mouseman Serial / PS2 (OEM)	16 / 18

Microsoft

2 Button Serial / PS2 (w/System)	$20 / 22
Intelli Serial / PS2 (w/System)	30

KEYBOARDS

104-Key Keyboard for Windows 95	$11
FOCUS	
FK2001 for Windows '95	22
FK6200W/7200W	18 / 23
FK8200 / 9200	34 / 39
Keytronics 104-Key for Windows 95	15
Lite-on SK-6000 / SK-6000T	35 / 52
Mitsumi 104-Key for Windows 95	11
Maxiswitch Nova for Windows 95	15
Maxiswitch Nova PS/2	16
Microsoft Natural Key (w/System)	43

MEMORY & CPU

SIMM	
1MB (1x3) / 4MB (4x3) (30 Pin)	6 / 16
4MB (1x32) / 8MB (2x32) (72-Pin)	14 / 25
16MB (4x32) / 32MB (8x32) 72-Pin)	48 / 86
4MB (1x32) / 8MB (2x32) (EDO)	14 / 24
16MB (4x32) / 32MB (8x32) (EDO)	45 / 84
4MB (1x36) / 8MB (2x36) (Parity)	21 / 42
16MB (4x36) / 32MB (8x36) (Parity)	58 / 110
DIMM	
16MB (2x64) / 32MB (4x64)	63 / 114
64MB (8x64)	238
CPU	
AMD 486DX4-100 / K5-100	44 / 64
AMD K5-P133 / 166	85 / 94
AMD K6-166 / 200 / 233	138 / 184 / 360
6X86 P-166+ / P-200+	64 / 70
Cyrix M2-P166+ / M2-P200+	90 / 138
Intel P5-150 /166 / 200	96 / 130 / 178
Intel Pentium Pro-180 / Pro-200	194 / 468
Intel MMX-166 / 200 / 233	148 / 248 / 334
Intel Pentium II-233/266/300	458/538/778

MODEMS & FAXES

Fax Modem 14,400 Internal	$24
Fax Modem 14,000 Internal w/Voice	28
Fax Modem 33.6 with V.34 Int	40
Fax Modem 33.6 with Voice Int	46
Fax Modem 33.6 Ext	66
Fax Modem 56.6 with Voice Int	78
PCMCIA Fax Modem 28.8 Data w/V.34	38
PCMCIA Fax Modem 33.6 Data w/V.34	86
PCMCIA Fax Modem 56.6	126
SUPRA 33.6 Fax Modem Int (Bulk)	54
SUPRA 33.6 Fax Modem w/Voice Int (Retail)	88
SUPRA 56.6 Fax Modem w/Voice Int	100
US ROBOTICS	
Sportster 28.8 Winmodem (Bulk)	34
Sportster 33.6 Data Winmodem Int (Bulk)	64
Sportster 33.6 Data Winmodem Int (Retail)	78
Sportster 28.8 FM with Voice Int	54
Sportster 28.8 FM with Voice Ext	84
Sportster 33.6 Data Fax Modem Int (Bulk)	79
Sportster 33.6 Data Fax Modem (Retail)	116
Sportster 33.6 Data Fax modem w/Voice Int (Bulk)	88
Sportster 33.6 Data Fax Modem w/Voice Int (Retail)	134
Sportster 33 6 Data Fax Modem w/V.34 Ext (Retail)	138
Sportster 33.6 Data Fax Modem w/Voice Ext	155
Sportster 56.6 Internal w/o Voice (Bulk)	136
Sportster 56.6 Internal w/Voice (Bulk)	164
Sportster 56.6 Internal w/Voice (Retail)	176
Sportster 56.6 External w/o Voice (Retail)	182
Sportster 56.6 External w/Voice (Retail)	198

MONITORS *

14" VGA Mono	$88
14" SVGA 1024•768 .28 NI	144
15" SVGA 1024•768 .28	196
17" SVGA 1280•1024 .28	378

CTX

14" Super VGA 1024•768 .28 NI	$178
15" Super VGA 1024•768 .28	248
17" Super VGA 1280•1024 .28 (PL700)	398
17" Super VGA 1280•1024 .28 (VL700)	418

IIYama (IDEK)

MF-8515 15" 1280•1024 .28	$314
MF-8617E 17" 1600•1200 .26	534
MF-8221E 21" 1600•1200 .30	1268

Impression

3+ 14" 1024•768 .28 NI	$149
5+ 15" 1280•1024 .28 NI	218
7+ 17" 1280•1024 .28 NI	404
17" Vienna Pro	578

MAG INNOVISION

DJ530 15" 1280•1024 .28	$264
DX15T 15" .25 Trinitron OSD Win 95	308
710V² 17" 1280•1024 .28	454
DJ700 17" .26 1280•1024	508
DX700T 17" .25 Trinitron OSD Win 95	588

NANAO®

FX-B5 15" .28 / FX-C5 17" .28	494 / 686
FX-C6 17" .26 / TX-C7S 17" .25	767 / 958
T2-17 .25	847
TX-D7S 20" .25 / FX-E7 21" .28	1618 / 1608

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A700 / E700 / M700	568 / 637 / 726
E1100 / P1150 21" .28	1338 / 1478

NOKIA

449XA 15" / 447Z 17"	$376 / 578
447XAV 17" / 447K 17"	928 / 1358
445XI 21"	1698

SONY

100SX 15"	$322
100SF 15"	337
200SX 17" 1280•1024 .25 65 Hz	567
200SF 17" 1280•1024 .25 75 Hz	637
300SFT 20" 1600•1024 .31	1328
20SE2T 20" .25	1748

ViewSonic®

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E655 15" 1024•768 .28	264
15GS 15" 1280•1024 .28	294
15GA 15" 1280•1024 .27 w/Speakers	354
EA771 17" 1280•1024 .28 w/Speakers	498
G771 17" 1280•1024 .28	487
17GA 17" 1280•1024 .27 w/Speakers	558
17PS 17" 1600•1280 .25 Green	604
GT770 17" 1280•1024 .25	608
PT770 17" 1600•1280 .25	617
PT775 17" 1600•1280 .25	657
G800 20" 1600•1280 .28	937
G810 21" 1600•1280 .25	1137
PT 813 21" 1600•1280 .28	1318
P815 21" 1800•1440 .25	1357
VP140	2238

*** Monitor Viewable size may be smaller than advertised size**

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16 BIT Ethernet Card ISA (Combo)	$15
32 BIT PCI Ethernet Card (Combo)	18
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PCMCIA Ethernet Card (Combo)	58

3Com

3C509 ELINK III TP	$45
3C509 ELINK III Combo	62
3C900 PCI TP (New)	69
3C900 PCI Combo (New)	81
3C905 TX PCI 10 / 100	63

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5-Port Ethernet Hub	$39
9-Port Ethernet Hub	49
17-Port Ethernet Hub	88
24-Port Ethernet Hub	224

Intel

EtherExpress Pro 10 / 100 TX PCI	$58

SCANNERS

Imager 730 Flatbed 30-Bit Color 9600 300x600dpi	$118
Adara Scan 016 Image Star I	198
Adara Scan 018 Image Star III w/o TMA	828

SOFTWARE

Microsoft Super Home Bundle (w/system)	$68
Microsoft Windows 95 Full Copy CD Version (w/system)	84
Microsoft Windows 95+ (with System)	118
Microsoft DOS 6.x (with System)	38
Microsoft Office Professional OEM CD Version (w/System)	168
Microsoft Windows 3.x (with System)	56
Microsoft Windows for Workgroup (with System)	62
Microsoft Windows NT 4.0 Server	
5 Clients (with/System)	BEST
10 Clients (with/System)	BEST
Microsoft Windows NT 4.0 Workstation (with Sys)	BEST

TAPE BACKUPS

Seagate 800MB w/Tape	$78

COLORADO MEMORY SYSTEMS

T-3000T 3.2GB Int. w/tape	154
T-4000T 8.0GB SCSI Int w/tape	333
Tape for 800MB	27
IOMEGA	
Ditto Easy 800 Insider	98
Ditto Easy 800 Parallel	128
Ditto Easy 3200 Insider w/Cartridge	178
Ditto 800/3200 Cartridge	30 / 35
Jaz SCSI Drive 1.0GB Insider	278
Jaz SCSI Drive 1.0GB External	378
Jaz SCSI Drive Cartridge	94
Zip Drive 100MB External Parallel	138
Zip Drive 100MB External SCSI	138
Zip Drive 100MB Cartridge	15

VGA CARDS

MGP Card	$11
SVGA ISA w/1MB	27
Cirrus Logic PCI w/1MB	19
Cirrus Logic PCI w/MPEG 1MB	23
S3 Virge 3D w/2MB EDO	35
Trident PCI w/1MB	19
Trident PCI w/1MB MPEG	22

ATI TECHNOLOGIES INC

3D Xpression 2MB EDO	48
3D Xpression+ w/o TV 2MB	63
3D Xpression+ w/o TV 4MB	80
3D Xpression+ w/ TV 2MB	74
3D Xpression+ w/ TV 4MB	92
ProTurbo w/TV 4MB SGRAM	123
ProTurbo w/TV 8MB SGRAM	162
TV Tuner	108
Xpert@Work AGP 4MB	178
Xpert@Work AGP 8MB	218

DIAMOND

Edge 3D 2MB DRAM	29
Edge 3D 2MB VRAM	46
Stealth 64 PCI 1MB w/MPEG	44
Stealth 64 PCI 2MB w/MPEG	48
Stealth 64 Video PCI 2MB (VRAM)	77
Stealth 64 Video PCI 4MB (VRAM)	123
Stealth 3D 2000 PCI 2MB	48
Stealth 3D 2000 PCI 4MB	68
Stealth 3D 3000 PCI 2MB (VRAM)	99
Stealth 3D 3000 PCI 4MB (VRAM)	136
Fire GL1000 4MB (Bulk)	114
Fire GL1000 4MB (Retail)	184
Fire GL1000 8MB (Bulk)	158
Fire GL1000 8MB (Retail)	204
Fire GL1000 Pro 4MB	178
Fire GL1000 Pro 8MB	208
Monster 3D 4MB	139
Viper V330 AGP 4MB	162

MATROX

Millennium 2MB (Bulk)	134
Millennium 4MB (Bulk)	168
Millennium 2MB (Retail)	154
Millennium 4MB (Retail)	170
Millennium II 4MB (Bulk)	156
Millennium II 4MB (Retail)	178
Millennium II 8MB (Bulk)	248
Millennium II 8MB (Retail)	288
Mystique 2MB (Bulk)	92
Mystique 4MB (Bulk)	115
Mystique 2MB (Retail)	110
Mystique 4MB (Retail)	130
Mystique 220 2MB (Bulk)	88
Mystique 220 2MB (Retail)	98
Mystique 220 4MB (Bulk)	108
Mystique 220 4MB (Retail)	124

Number 9

Imagine 128 S2E PCI 4MB	254
Imagine 128 Series 2 PCI 4MB	388

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486DX4-100/256K PCI-VLB	$104
AMD K5-P100/256K (Triton VX)	138
AMD K5-P133/256K (Triton VX)	158
AMD K5-P166/256K (Triton VX)	168
6X86-P166+/256K (Triton VX)	138
6X86-P200+/512K (Triton TX)	148
P5-150/256K (Triton VX)	168
P5-166/256K (Triton VX)	208
P5-200/256K (Triton VX)	248
AMD K6-166/512K (Triton TX)	208
AMD K6-200/512K (Triton TX)	258
AMD K6-233/512K (Triton TX)	438
MMX-P166/512K (Triton TX)	228
MMX-P200/512K (Triton TX)	328
MMX-P233/512K (Triton TX)	408
ASUS	
P5-150/256K (VX97)	178
P5-166/256K (VX97)	208
P5-200/256K (VX97)	248
MMX-P166/256K (VX97)	248
MMX-P200/256K (VX97)	348
MMX-P233/256K (VX97)	428
MMX-P166/512K (TX97)	308
MMX-P200/512K (TX97)	408
MMX-P233/512K (TX97)	488
Pentium II-233	648
Pentium II-266	728
Pentium II-300	958
INTEL	
P5-150/256K (MARL) ATX	208
P5-166/256K (MARL) ATX	238
P5-200/256K (MARL) ATX	278
P5-150/256K (TUCSON) ATX	278
P5-166/256K (TUCSON) ATX	308
P5-200/256K (TUCSON) ATX	348
MMX-P166/512K (ANCHORAGE) ATX	328
MMX-P200/512K (ANCHORAGE) ATX	428
MMX-P233/512K (ANCHORAGE) ATX	508
MMX-P166/512K (LONETREE) ATX	318
MMX-P200/512K (LONETREE) ATX	418
MMX-P233/512K (LONETREE) ATX	498
Pentium Pro PP-180 (VENUS) ATX	298
Pentium Pro PP-200 (VENUS) ATX	578
Pentium II-233 (PORTLAND) ATX	648
Pentium II-266 (PORTLAND) ATX	718
Super Micro	
Pentium Pro PP-180	388
Pentium Pro PP-200	658
DUAL Pentium Pro PP-200 w/1 CPU	718

MULTIMEDIA

16-Bit Sound Card	$15
Altec Lansing ACS 51 / ACS 52	54 / 70
Altec Lansing ACS 53 / ACS 500	118 / 284
CD Writer Phillips CDD2600/12 Int	418
CD Writer Phillips CDD2600/20 Ext	548
CD Writer Yamaha CDR-400ti SCSI Int	548
CD Writer Yamaha CDR-400ti IDE Int	548
Creative Sound Blaster 16 / 32 PNP	40 / 69
Creative Sound Blaster AWE 64 Value (Bulk)	78
Creative Sound Blaster AWE 64 Gold (Bulk)	155
Creative Sound Blaster AWE 64 Gold (Retail)	176
Digital Camera Sony DSC-F1	778
CD-ROM 4X / 6X / 8X IDE	29 / 46 / 52
CD-ROM 12X / 16X IDE	54 / 58
CD-ROM 20X / 24X IDE	64 / 74
Mitsumi 6X 6-Speed IDE	48
Mitsumi 8X 8-Speed IDE	54
Mitsumi 12X 12-Speed IDE	61
Mitsumi 16X 16-Speed IDE	70
Mitsumi 24X 24-Speed IDE	79
NEC 6-Speed SCSI	92
NEC 16-Speed SCSI	94
NEC CDR 4300 8x4 IDE CD Changer	88
TEAC 24X 24-Speed IDE	81
TEAC 16X 16-Speed SCSI	108
Toshiba 24X 24-Speed IDE	82
Toshiba 12X 12-Speed SCSI	98
Toshiba 15X 15-Speed SCSI	130
Speakers 60W/80W/120W	10 / 16 / 24
Speakers 180W/300W	26 / 39
Yamaha Speakers M7 / M15	37 / 59
Yamaha Speakers M25 / M35 / M45	98 / 128 / 164

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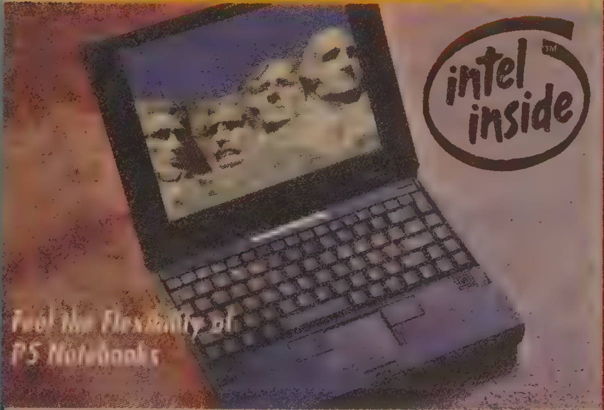

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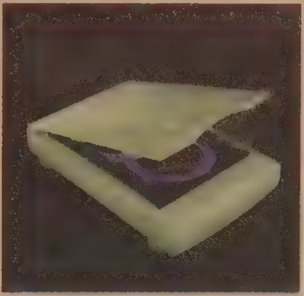

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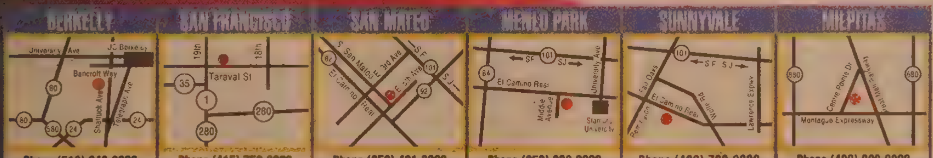

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CLASSIFIED ADVERTISING SECTION STARTS ON PAGE 205

2BG COMPUTERS ... 32
A&A TECHNOLOGY ... 174, 175
AAA MEDIA ... 66
ACER FACTORY OUTLET STORE ... 18
ACME MICROSYSTEMS ... 236
AIM COMPUTER ... 125
ALLDOMAINS.COM ... 160
AMERICA COMPUTERS ... 103
AMERICAN ADVANTECH CORP. ... 47
AMT INTERNATIONAL ... 120
ANAWAVE SOFTWARE ... 161
ANTI-V ... 2C
API COMMUNICATIONS ... 29
APPRO INT'L ... 148, 149
ARESCOM ... 19
ARISE COMPUTER ... 69
AROMA COMPUTER ... 122, 123
ART MULTIMEDIA SYSTEMS ... 121
ASA COMPUTERS ... 71
BAY COMPUTER ... 111
BCSA COMPUTERS ... 224
BELL COMPUTER ... 44
BELMONT SYSTEMS ... 128
BENITEK COMPUTER ... 117
BESQ SYSTEMS ... 64, 65
BETA 90'S ... 33
BG COMPUTER ... 73
BINARY INFORMATION SYSTEM ... 189
CAC (COMPUTER APPLICATIONS CO.) ... 97
CALIFORNIA LS ... 59
CALLAN CORP ... 159
CENTAUR TECHNOLOGY ... 2K
CENTRAL ... 80–88
CHEM USA CORP ... 2H, 21
CHICOTEC ... 105
CITY COM ... 4
COASTAL ... 56
COMMAX TECHNOLOGIES, INC. ... 27
COMPU 11 ... 11
COMPU D ... 168, 170, 204
COMPUMART ... 169
COMPUTER JAM ... 25
COMPUTER RENAISSANCE ... 60
COMPUTER SOURCE ... 16, 17
COMPUTOWN ... 78, 79
COMTEK COMPUTERS ... 199
CPU & MEMORY EXCHANGE CLUB ... 233
CYBEREX TECHNOLOGY INC. ... 18D
CYPRESS COMPUTER ... 43
DATA COM SYSTEMS ... 90, 91
DIAMOND LANE ... 154
DISK DRIVE DEPOT ... 3
DISKS DIRECT ... 24
DJ COMPUTERS ... 196
D NET COMPUTERS ... 6
DYNATEK INFOWORLD, INC. ... 154
EARTHLINK ... 153
ECONO OFFICE SUPPLY ... 173
EDC SYSTEMS ... 72
ENVISIONS SOLUTION TECHNOLOGY ... 8
EVERGREEN COMPUTERS INT. ... 164, 165
FALL INTERNET WORLD 97 ... 2J
FASTLINK NETWORK PRODUCTS ... 171
FINE TEC ... 67
FMG ... 2B
FOR-U COMPUTER ... 140
FORTUNE MICRO ... 126
FUTURE COMPUTING SOLUTIONS ... 107
GEONET COMMUNICATIONS ... 143
GIGABYTES ... 60
GNT ELECT. ... 61
GOLDEN MICRO COMPUTERS ... 187
GOLDEN VALLEY SYSTEMS ... 22
GRANITE DIGITAL ... 12
HALTED SPECIALTIES ... 75
HD SYSTEMS ... 34–36
HIQUALITY SYSTEMS (HI-Q) ... 21
HI-TECH USA ... 238–243
HITRON SYSTEMS ... 146, 147
HKG COMPUTERS ... 163
HYPERSURF INTERNET SERVICES ... 152
IBI COMPUTERS ... 5
ICON MICROSYSTEMS ... 44
IDT WINCHIP ... 2K
INFITECH ... 100, 101
INPUT AUTOMATION ... 23
INREACH INTERNET ... 18H
INSTANTAUCTION.COM ... 151
INTERNET MARKETING SERVICES ... 158
INTERNET ZAP ... 172
INTERPRO ... 201
IQ INFOQUEST ... 49
ITS CD ... 72
J&K TECHNOLOGY ... 39
JPS NET ... 155
KINGSTAR COMPUTER ... 13
KONICOM ... 181
LAITRON ... 136–137
LAPTOP SUPERSTORE ... 38
LEGEND COMPUTER ... 45
LIUSKI INTERNATIONAL ... 2D, 2E
MAC ... 133
MAGITRONIC ... 2D, 2E
MARCAN INC ... 44
MARKET PRO ... 197
MDI TECHNOLOGY ... 202
MECKLERMEDIA ... 2J
MEDIA ON ... 18B, 18C, 54, 55
MERCURY COMPUTER ... 245
MERIDIAN COMPUTER SYSTEM ... 167
MIC COMPUTER ... 9
MICROGATE ... 37
MICROTIMES ... 38, 48, 138, 180, 188, 242
MICROTIMES QUOTATION HOTLINE ... 50, 51
MICROTIMES SUPERSTOPS ... 226, 227
NET LIMITED ... 57
NETIS TECHNOLOGY ... 62, 63
NETWORK ASSOCIATES ... 157
NORDIC COMPUTERS ... 12
OFFICE PRO SYSTEMS ... 18F, 18G
OST, INC. ... 235
PALO ALTO MICRO ... 18
PARAMOUNT COMPUTERS ... 119
PC DOCTOR ... 77
PC TEN ... 124
PERFECT SOLUTION MULTIMEDIA ... 244
PIONEX ... 2B
PIXEL USA ... 178, 179
POLYWELL COMPUTERS ... 30, 31
PRIMETECH SYSTEMS INTEGRATION ... 18A
PROMOX SYSTEMS ... 115
PROVEN TECHNOLOGY ... 53
RECORTEC ... 2L
RIX TECHNOLOGY ... 95
ROBERT AUSTIN CORP. ... 191
SAMPO ... 2G
SCEPTRE ... 2A, C3
SILICONRAX ... 2F
SLIP.NET ... 7
SOFTWARE CENTER ... 197
SONGTECH ... 76
STARLITE ELECTRONICS ... 108, 109
STORAGE SYSTEMS ENG. ... 96
SUNWAY GRAPHICS ... 131
SUPERCOM ... C2, C4
SWEET MEMORY ... 15
SYMPHONY COMPUTER ... 40, 41
T-ZONE ... 37
TEGAM INTERNATIONAL ... 2C
THE PC DOCTOR ... 77
TOP DATA / NACOM ... 185
TRUE COMP AMERICA ... 135
TSOFT ... 172
UMIRACLE MICRO SYSTEMS ... 228–232
UNITED MICROSYSTEMS ... 93
UNIVERSAL COMPUTER PRODUCTS ... 223
USM DISTRIBUTORS ... 141
VALUE NET INTERNET SERVICE ... 140
VARIANT MICROSYSTEMS ... 113
W&K INTERNATIONAL ... 203
WEDGE TECHNOLOGY ... 18E
WEIRD STUFF WAREHOUSE ... 183
WESTECH MICRO ... 37
WORLD NET ... 193–195

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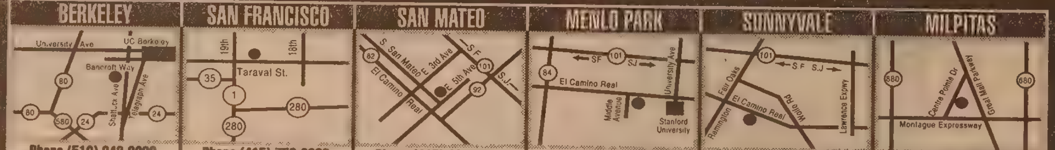

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Pentium II-233 (Asus M/B) ATX	2088
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Dual PP-200 (Super Micro) w/1 CPU	2088
PP-200 (Intel Venus) ATX	1988
MMX-P233/512K (Intel Anchorage) ATX	1898
MMX-P200/512K (Intel Anchorage) ATX	1818
MMX-P166/512K (Intel Anchorage) ATX	1718
MMX-P233/512K (Asus TX 97)	1838
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MMX-P233/512K (Intel Lonetree) ATX	1518
MMX-P200/512K (Intel Lonetree) ATX	1438
MMX-P166/512K (Intel Lonetree) ATX	1338
MMX-P233/256K (Super Micro)	1428
MMX-P200/256K (Super Micro)	1348
MMX-P166/256K (Super Micro)	1248
MMX-P233/512K (Intel Triton TX)	1378
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AMD K6-233/512K (Intel Triton TX)	1418
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P5-200/256K (Intel Triton VX)	968
P5-166/256K (Intel Triton VX)	918
P5-150/256K (Intel Triton VX)	898
6X86-P200+/512K (Intel Triton TX)	878
6X86-P166+/256K (Intel Triton VX)	858
AMD K5-P166/256K (Intel Triton VX)	888
AMD K5-P100/256K (Intel Triton VX)	868

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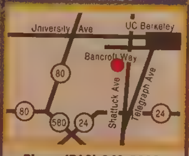

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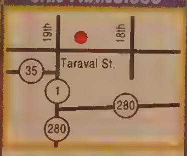

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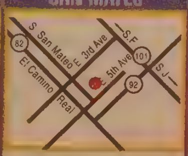

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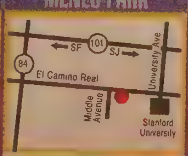

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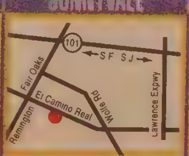

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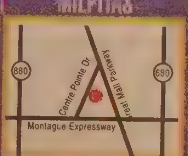

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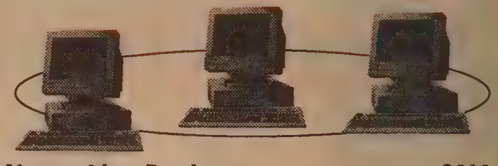

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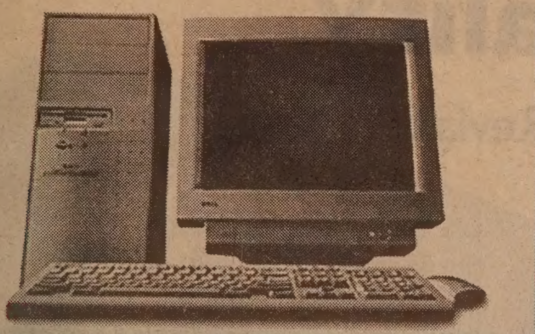

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DVORAK'S LAST COLUMN • BY JOHN C. DVORAK

Locked Into An Alternative Reality

Or, Rituals And The Computer, Revisited

The acquisition of mythology, rites and ceremony gives the culture a way to think about and recognize any new invention. Anything not fully understood is ritualized.

This is a common theme in Anthro 1, and I used to enjoy evaluating such things with regard to the computer and its early days. Now it's the time to look at the Net the same way.

A favorite quote of mine from *Cultural Ways*, by Robert Taylor: "Ritual provides a reassurance and feelings of security in the face of the psychological disturbances in everyday life...Ritual may be viewed as providing reassurance in the sense that it is a ready-made solution to problems which may be poorly understood and difficult in solution." The simple act of listening to the telephone prior to dialing, just to be certain a dial tone is present, is a ritual. It once had a purpose. When there were party lines, for example, the line wasn't always free. But, now, (out of thousands of calls that you probably have made) how many times has the dial tone not been there? Probably too low a number to continue the ritual.

Other rituals are used every day. Shaking hands, right hands only, is an old tradition to show that no weapons are carried. Many people nod when they greet a friend on the street. The nod is a carryover from the days when men tipped the hats that they wore and women curtseyed. The reasons for these things are lost to history and have become ritualized.

Ritual And Technology

With the computer an entire set of rituals have appeared. They may have once had a real purpose, which has mostly been forgotten. The purpose may never have been known. Without an understanding of the how and why something is done, a ritual is created.

Most computer commands were handed down from knowledgeable user to novice. The tendency of the expert is to not explain but simply say, "Do it this way!" Without an explanation or understanding the imagination can go wild.

After all, look what happened to Mickey Mouse in "The Sorcerers Apprentice." In *Fantasia*, Mickey thought that he knew the proper incantation. He tried something that he wasn't supposed to do, and he did it wrong. He unleashed a nightmare of brooms and buckets.

Can you imagine the fears of a newcomer to the computer?

When that novice trains a new novice, the emphasis is on doing the incantation *exactly* right. The ritual is reinforced. The unknown horrible things that could happen (like blowing up the whole computer system, or something) will be averted if the ritual is followed to the letter. Unforeseeable, horrible, and certainly detrimental things will happen if the mighty computer is not appeased with the proper ritual. Who knows what "the beast" might do, and what havoc will begin?

With the computer, the practice of simply parroting commands, with no understanding of exactly what the meaning is, or how the command works, is a ritual. Of course this recently gave way to the GUI with its own rituals.

Myths of the evil and frustrating computers were reinforced by naive ritual-rut users. It isn't helped along much by incompetent salesmen.

Banks and credit institutions commonly use the computer as a scapegoat, the source of bad news. When credit is denied, or the balance is off—it is because the computer *said so*. That not only gives credence to the story, but blames something that can't be yelled at, and cannot be talked to. The computer cannot be fired (unlike the clerk). So, the computer becomes omnipotent, and takes all the blame. (It's like blaming the dog—it cannot argue back, nor even be aware of its burden of guilt.)

The Ritual That Wouldn't Die

The magic of computers and the rituals are a daily part of our lives. In the case of the home computer user, many of the rituals once had validity, but due to the advancements in technology, no longer do.

For example, how often are you told to always take the diskette from the drive? This is because the drive will destroy the diskette when the machine is turned off. While it was true years ago, it never happens anymore. And what about the myth that X-rays damage disks?

Unfortunately, once an object and its rituals are accepted, any changes are resisted. The early computers had lights which flickered. They were both decorative and they indicated if the machine was at work, or at rest. The lights were an integral part of the communication between the user and the machine. When CRTs and when other methods of communication came into use the little flashing lights became useless. However, the culture had come to equate flashing lights to computers. After all, every movie, television show, and sight gag about computers had references to flashing lights. The computer must have lights. The large machines of today have lights flashing so that the computer will be recognized *as* a computer. We get nervous when we don't see a flashing light to indicate disk drive access.

What this all means, of course, is that there is an underlying resistance to progress. Once something is established, with its assuring rituals, it is hard to veer from the set course. Look at cars. Attempts to change the shift lever to push buttons or to move it to a location other than the steering wheel or floor have met with resistance. It won't happen no matter how practical. The Dvorak keyboard is another example.

Send Me Your Rituals

The Internet has introduced new rituals. The browser designs, for example, are going to be with us forever because people will ritualize their use. People will always worry when "www" is not used in a Web address. Spending a lot of time on the Net will always be referred to as "browsing."

I've begun to compile a list of new rituals such as this and would appreciate any contributions from readers. Send them to: *dvorak@dvorak.org*. Thanks! ■

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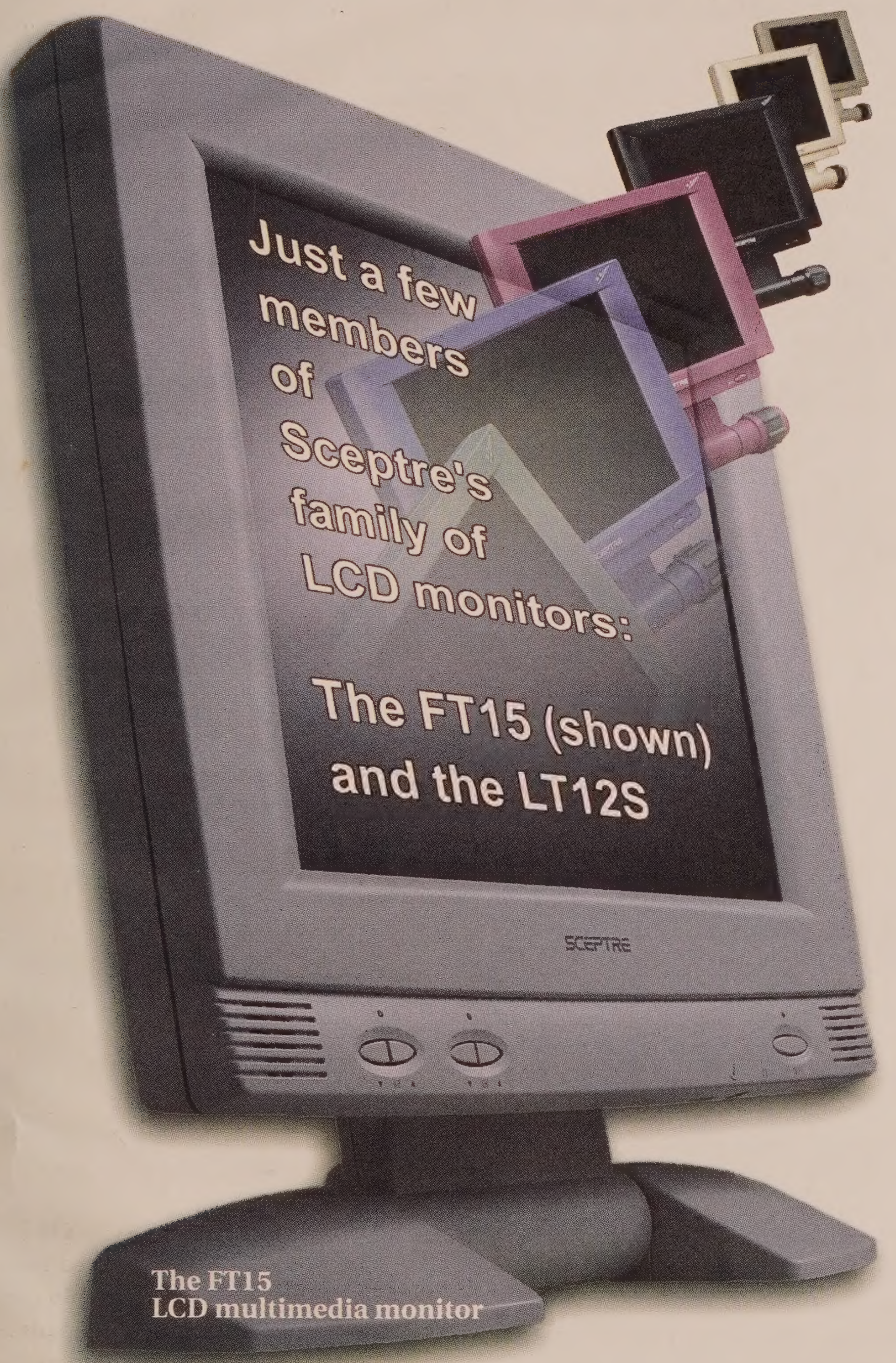
Been There, Done That!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